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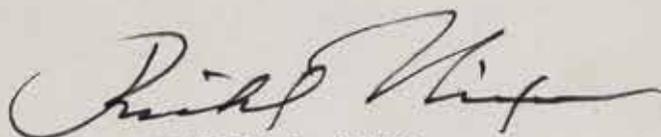


The Air and Space Sale

New York | September 17, 2019

FIRST TELEPHONE CALL TO THE MOON...

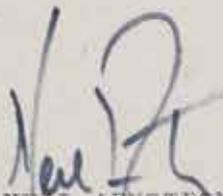
"BECAUSE OF WHAT YOU HAVE DONE, THE HEAVENS HAVE BECOME
A PART OF MAN'S WORLD. AND AS YOU TALK TO US FROM THE
SEA OF TRANQUILITY IT INSPIRES US TO REDOUBLE OUR EFFORTS
TO BRING PEACE AND TRANQUILITY TO EARTH."



RICHARD M. NIXON

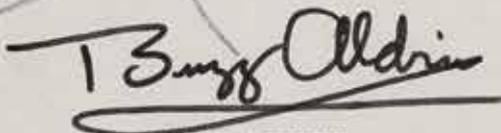
THE PRESIDENT OF THE UNITED STATES

JULY 20, 1969



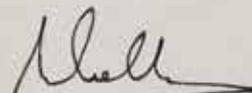
NEIL ARMSTRONG

ASTRONAUT



EDWIN ALDRIN

ASTRONAUT



MICHAEL COLLINS

ASTRONAUT

The Air and Space Sale

New York | Tuesday September 17, 2019 at 1pm

BONHAMS

580 Madison Avenue
New York, New York 10022
bonhams.com

PREVIEW

Saturday, September 14th,
12-5pm
Sunday, September 15th,
12-5pm
Monday, September 16th,
10am-5pm
Tuesday, September 17th,
10am-12pm

SALE NUMBER: 25262

Lots 1 - 156

CATALOG: \$35

ILLUSTRATIONS

Front cover: Lot 34
Inside front cover: Lot 90
Inside back cover: Lot 22
Back cover: Lot 92

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Bidding by telephone will only be accepted on a lot with a lower estimate in excess of \$1000.

Please contact client services with any bidding inquiries.

Please see pages 75 to 79 for bidder information including Conditions of Sale, after-sale collection and shipment. All items listed on page 79 and/or noted as W next to the lot number will be transferred to off-site storage, if not removed by 5pm on Wednesday, September 18th.

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To bid live online and / or leave internet bids please go to www.bonhams.com/auctions/25262 and click on the Register to bid link at the top left of the page.



Introduction

Welcome to our 2019 Air and Space auction. This year marks the 50th Anniversary of the first manned Moon landing and we have put together an auction that celebrates that achievement, the many steps that preceded it, and the developments that followed. Our star lot, a Sputnik-1 EMC/EMI lab model manufactured in February 1957, dates from one of the most important events in the history of space exploration. The Sputnik program created the urgency and focus necessary for the United States space program; without it, we might never have made it to the Moon so quickly.

We open the sale with Aviation & Beyond, which includes materials from pioneers and heroes like the Wright Brothers and Charles Lindbergh, plus a 50-year aviation photography archive from Henry Woodhouse, the founder of the magazine Flying (lot 4). The section also includes a wonderful selection of contractor's models with examples rarely seen on the market.

The Soviet/Russian Space Program section begins with a letter from the father of Soviet rocketry, Konstantin Tsiolkovsky (lot 33). The Sputnik-1 EMC/EMI lab model (lot 34) formerly owned by Dr. Mikhail Ryazansky, director of NII-885, the Soviet facility responsible for the transmitter inside the Sputnik-1, follows. This example was previously on display at the Deutsches Technikmuseum in Berlin. The section also includes a selection of items from the great manned (and womanned) Soviet spaceflights.

Our final and largest section is that of the United States Space Program. Highlights include a rare Gemini 1/8 scale model (lot 69); a collection of ILC, Dover Beta cloth rubber stamps that include most of the astronauts from the Apollo Program (lot 81); and a selection of Lunar Module contractor's models (lots 85-87) that includes 2 prototypes. Of course, we have a selection of items from Apollo 11: a partial transcript of the first telephone call to the Moon (lot 90) signed by Armstrong, Aldrin, Collins and Richard Nixon; a flown Lunar Module checklist (lot 91); a Beta cloth emblem signed by the crew (lot 92); a photograph of the crew signed by all and inscribed by Armstrong (lot 93); and a nice selection of photographs, charts and other items. The remaining items in the section include an Apollo Command Module window (121); an Apollo 17 flight plan flown to the lunar surface; and a petition to President Ronald Regan for Space Station Freedom signed by 19 astronauts.

This is just a sampling of the auction highlights. We encourage you to take a closer look in the following pages and stop by our preview if you are in the area. Please do not hesitate to contact me with questions

ADAM STACKHOUSE
Senior Specialist

ORDER OF SALE:

Aviation & Beyond	1-32
Soviet/Russian Space Program	33-58
United States Space Program	59-156

Aviation & Beyond

Lots 1 - 32



Original



1

1

WRIGHT BROTHERS: FABRIC SEGMENT FROM THE 1903 KITTY HAWK FLYER.

Original sample of fabric from the 1903 Wright Flyer, measuring approximately 1 1/4 inches square, affixed to an 8 x 10 inch certificate with image of the flyer taking off at Kitty Hawk, printed with a statement of authenticity reading "ORIGINAL FABRIC FROM KITTY HAWK 'WRIGHT FLYER' CERTIFICATION For Henri Bouche ... I certify that this piece was used in the first successful flight in history by Orville Wright on December 17, 1903 at Kitty Hawk, N.C." bearing the signature of Lester D. Gardner.

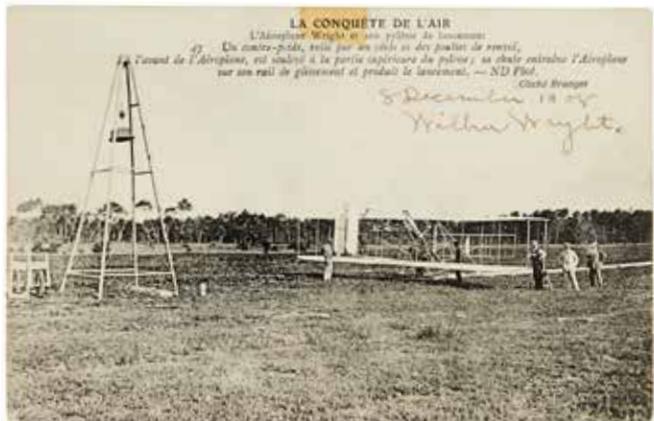
WITH: A piece of wood from the Wright's hangar at Kitty Hawk, on a small souvenir card bearing a photo of the hangar, printed "THE FIRST HANGAR — KITTY HAWK. A true piece of the First Airplane Hangar in the World." Wood approximately 1/2 x 1/4 inches. Also included is a Letter Signed by Lester Gardner to Henri Bouche regarding the souvenir.

Orville Wright reassembled the Kitty Hawk machine for its first public exhibition in 1916, at the Massachusetts Institute of Technology. Finding the original fabric could not be used, he substituted new fabric and kept some of the original fabric. On his death in 1948, Orville's executors discovered the fabric and asked Gardner, who had also been on the board of M.I.T., to distribute sections to aeronautical luminaries. Henri Bouche was a French aviation pioneer serving in World War I and later publisher of *L'Aeronautique* and a board member of Air France.

\$6,000 - 8,000



2



3

2

WRIGHT, WILBUR. 1867-1912.

La conquete de l'air. Collotype photographic postcard, 90 x 140 mm, depicting Wilbur in flight at Le Mans, [August, 1908], captioned at the top *L'aéroplane de l'Aviateur américain Wright au début de l'essor de vol plané ou il va parcourir une distance de 10 kilomètres, a une hauteur moyenne de 20 mètres*, and SIGNED ("Wilbur Wright") in the center of the image over the roof of the hangar. Tape residue at top edge, slight soiling.

One of Wilbur's earliest flights at Le Mans in 1908, with the hangar in the background, which was Wilbur's base of operations at Le Mans. The hangar also served as Wilbur's primary residence during his stay, outfitted with cooking utensils and a pantry full of canned foods.

\$3,000 - 5,000

3

WRIGHT, WILBUR. 1867-1912.

La conquête de l'air. Collotype photographic postcard, 90 x 140 mm, depicting Wilbur in flight at Le Mans, captioned at the top *L'Aéroplane Wright et son pylôn de lancement....*, and SIGNED ("Wilbur Wright") below caption at upper right, and dated 8 December, 1908. Tape residue at top edge, slight soiling.

Here Wright's flyer is depicted with the derrick apparatus that was used to launch the plane by quickly pulling it to a takeoff velocity. The cables running from the derrick to the underside of the plane are clearly visible.

\$3,000 - 5,000



4

EARLY AVIATION PHOTOGRAPHY ARCHIVE.

CHRONICLING 20TH CENTURY AVIATION FROM THE EARLIEST WRIGHT BROTHERS IMAGES THROUGH TO COMMERCIAL AND MILITARY APPLICATIONS.

Over 1300 photographs, generally silver gelatin prints, approximately 13 1/2 x 10 1/4 inches through 2 3/8 x 3 3/8 inches, early 1900s through c.1945, many with editor's marks, publication stamps on verso.

WITH: Group of correspondence related to the Aeroclub, Aerial League of America and material related to early air mail.

Provenance:

Henry Woodhouse, 1884-1970, (ownership stamp or signature on verso of some images).

Henry Woodhouse, founder of the still extant magazine *Flying*, among several others, was one of original founders of the Aeroclub and the American Society of Aeronautic Engineering, was author of a number of the earliest authoritative books on aviation and was a major advocate of aviation during World War I. The present collection was apparently built over his career as a managing editor and publisher

and includes images as early as the earliest published photographs of the Wright Brothers Flyer taken by Jimmy Hare, to many other early aviation pioneers, World War I and World War II aviation, gliders, commercial aircraft, dirigibles and balloons, seaplanes, aviators, air shows, the Curtiss factory, aircraft engines, aircraft expeditions, around-the-world flights, and even a group of photographs of American rocket pioneer Robert H. Goddard. A majority of the photographs had been used in publications and are stamped on the verso and/or include press information slips. Woodhouse's position as a publisher and managing editor gave him an opportunity to assemble a massive collection that covers many important aviation landmarks.

Highlights include 10 photographs of the Wright Brothers and their flyer, each with *Collier's Weekly* stamp on verso and most by Jimmy Hare; a series of 19 large-format photographs of the Curtiss airplane factory, most with Jimmy Hare signature in the negative; a further group of 32 photographs by Jimmy Hare of various aviation events, etc. Should be seen.

\$50,000 - 70,000



5



6

5

LINDBERGH, CHARLES. 1902-1974.

13 items:

1. 7 Autograph Letters Signed ("Charles A. Lindbergh"), 24 pages, quarto, various places (most in transit), June 10, 1968 to April 25, 1971, on blue onionskin stationery, some smudging of ink, pages lightly thumbled.
2. 4 Typed Letters Signed ("Charles A. Lindbergh"), 4 pages, quarto, Scott's Cove, December 7, 1966 to March 25, 1968, light soiling otherwise fine.
3. 2 Autograph Maps with Annotations, 2 pages, quarto, n.p., n.d., light creasing, otherwise fine.

LINDBERGH TO A LADY FRIEND: "WHAT [DO] YOU VISUALIZE WHEN YOU USE THE WORD 'GOD'...?"

On a transatlantic flight to Paris in 1966, Lindbergh struck up a romantic friendship with Pan-Am flight attendant Adrienne Arnett. Over the next 5 years, the two corresponded on a variety of issues, including religion and philosophy, as well as the day to day issues affecting the airline. Sounding more like a college professor than a daredevil pilot, Lindbergh suggests that his correspondent read Lao Tse, Spinoza, St. Exupery, and Carl Jung. He also pushes her to question her own system of beliefs. From January 10, 1968: "Now that you have been in China and the Far-East for some months, and should you feel like writing about it (for heaven's sake don't do so otherwise) I'd like to know what you visualize when you use the word 'God' in the following sentence in your letter: 'One day I got off a bus and saw about twenty despondent looking crippled people being wheeled in wheelchairs, and I just got furious that God could be so heartless...' Do you see a form when you speak of God? If we understood more about the abnormalities and sufferings of life, I wonder if we would be as revolted by them." In another letter dated May 8, 1969, Lindbergh asks his correspondent: "What are you searching for? What would you like to find? I'd be interested. Can you define what you would like to find, even approximately? I suspect that in the 'miracle of life' and all that lies before and beyond it, are qualities more wonderful and desirable than anything our imaginations can devise--that unhappiness and suffering is valid only through a narrow band of time scale--evil as it may sometimes seem to life." For more about Arnett's relationship with Lindbergh, see Susan Herzog's 2000 biography, *Anne Morrow Lindbergh: Her Life*.

\$12,000 - 18,000

6 W □

B-17 ENGINE.

American, c.1940 1,200 hp Wright R-1820-97 "Cyclone" turbosupercharged radial engine, with glass table top in place of propeller and held in place by spinner. 1,600 x 1,100 mm.

The four-engine (1200 hp each) Boeing B-17 Flying Fortress heavy bomber, which cost over \$200,000 each in 1940 (the equivalent of about \$3,000,000 in today's market), was a key component of the United States Army Air Forces' (USAAF) World War II strategy in Western Europe. It dropped more bombs (640,000 metric tons) on German industrial and military targets than any other U.S. aircraft. It was relatively fast (287 mph maximum speed), high-flying, long-ranging (2,000 miles with 6,000 lb bomb load), and known for its toughness with a number of badly damaged B-17s still able to return to base. In one famous episode a German Messerschmitt Bf 109 fighter attacking a 97th Bomb Group formation went out of control and hit one of the B-17s, which continued to fly, its tail nearly severed. The B-17 headed back toward base, its gunners fending off two more Me-109s. Nearly 2 1/2 hours after the collision, the aircraft was able to make it back to base and land on the runway, its entire crew safe.

\$6,000 - 8,000

7

GRUMMAN AF-2S AIRCRAFT MODEL.

Hand-made contractor's model in painted wood, c.1945, on wooden stand, 15-3/4 inches long, 20-1/2 inch wingspan.

Provenance:

Manufactured by a major aerospace model shop.

The AF-2S was developed by the U.S. Navy along with AF-2W as a matched pair of hunter/killer anti-submarine aircraft. The carrier-based planes had their maiden flight in 1945 but were not operational until 1950. The AF-2W had a large bubble on the lower fuselage containing search radar, while the AF-2S had a more conventional weapons bay for torpedoes. The plane proved cumbersome to fly and had a high accident rate, and was replaced in 1955 with the S2F Tracker.

\$2,000 - 3,000

8

GULFSTREAM I AIRPLANE MODEL.

Hand-built wooden model of a Gulfstream I turboprop business plane, with glass base in the form of a sundial, contained in a custom wooden case. 15 x 18-1/2 x 6 inches, excluding stand.

Provenance:

Manufactured by a major aerospace model shop.

Grumman's Gulfstream I business aircraft was developed in 1957-1958, originally using a Navy transport aircraft as a basis, but eventually rejecting that design and starting over with an entirely new approach. It utilized 2 Rolls-Royce turbine engines, and had a comfortable cabin with room for passengers to stand. It was the first of a series of Gulfstream executive aircraft, providing multi-national reach for executives with large corporations.

\$1,000 - 1,500

9

GULFSTREAM II CONTRACTOR'S MODEL.

Model in fiberglass and metal, with wooden base, 650 mm wingspan, 28-1/2 inches in length, 18-1/4 inches high without base. Custom wooden box.

Provenance:

Manufactured by a major aerospace model shop.

The Grumman Gulfstream II executive jet was a development of Grumman's successful Gulfstream I design, but with the adoption of two Rolls-Royce Spey turbofan engines instead of the Gulfstream I's turboprop engines. This was in response to competition from Lockheed, Dassault, North American and Hawker Siddeley in the business jet market. A modified Gulfstream II with controls modified to mirror those of a space shuttle were used by NASA as trainers during the shuttle program. Grumman sold off its Gulfstream business in 1974 to American Jet Industries. Today it is a subsidiary of General Dynamics.

\$2,000 - 3,000



7



8



9



10

10

RIGEL SSM-N-6 CRUISE MISSILE MODEL.

Contractor's model of a U.S. Navy Rigel missile, circa 1950, in wood and metal, on a metal launch gantry, all attached to a glass base with white painted Grumman logo and lettering: "Project Rigel XSSM-N-6 Test Vehicle." 19 x 5 x 8 inches, excluding base, contained in a custom wooden box.

Provenance:

Manufactured by a major aerospace model shop.

Rigel was a pioneering cruise missile design, whose development concept dated back to World War II. The project was undertaken by the U.S. Navy in 1946, with the aim of producing a solid-propellant ship-launched rocket with supersonic speed capabilities, and a range of 500 nautical miles. Test launches were not successful, however, and after the Regulus subsonic cruise missile proved more practical, Project Rigel was cancelled in 1953.

\$1,500 - 2,500



11

11

NIKE-AJAX LIQUID PROPELLANT ROCKET ENGINE.

Aerojet General Corporation, 1950s, stainless steel and aluminum, 18 5/8 inches tall, with Aerojet General metal label listing order number and serial number.

The Nike-Ajax was the United States' first operational surface-to-air missile. It used a solid propellant booster and a liquid propellant second stage to achieve subsonic speeds. The present example is the liquid sustainer engine which produced 2,600 pounds of thrust for about 20 seconds. It used red fuming nitric acid and JP-4, a type of jet fuel, as its propellants. It was a very simple system with no moving parts for ease of operation and high reliability. The propellants were forced into the combustion chamber by compressed air. Development of the engine was begun in late 1945 by Aerojet-General, who were working with the project's originator Bell Labs. The missile became operational in 1953 and remained in service until 1963, by which time the Nike Hercules had taken over.

\$2,000 - 3,000



12

12

MARTIN P6M SEAMASTER MISSILE DEFENSE CONTRACTOR'S MODEL.

Set of models including a U.S. Navy Martin P6M SeaMaster Jet and accompanying plaque with proposed design of the Bushfire SARH missile and defenses, showing their location in the rear of the fuselage. Model in painted resin and metal, the plaque in wood with aluminum descriptive plate bearing a color-coding legend, Grumman logo, and identifying it as "Design #143." 16-1/2 inches long, wingspan 14-1/4 inches. With custom wood case.

Provenance:

Manufactured by a major aerospace model shop.

Grumman designed the "Bushfire" rear defense system for Martin's P6M SeaMaster flying boat. The SeaMaster, intended to give the Navy a carrier-based nuclear strategic defense aircraft, was cancelled in 1959 when the Navy opted to concentrate on the submarine-launched Polaris ballistic missile.

\$1,500 - 2,500

13

GRUMMAN MISSILE WIND TUNNEL TEST MODEL.

Machined steel model for wind tunnel testing, lacking markings on the model itself, on a circular wooden base with a plaque that reads "Grumman Design #142 Missile." 40 x 5.5 inches diameter, excluding stand.

Provenance:

Manufactured by a major aerospace model shop.

Grumman designed this SARH (semi-active radar homing) missile in the 1950s for the "Bushfire" rear defense system, to be installed in Martin's P6M SeaMaster flying boat. It does not appear to have been a successful design, as the standard specification for the SeaMaster calls for two 20-mm rear-firing cannons, not a missile defense system.

\$800 - 1,200

14

BENDIX GRUMMAN EAGLE MISSILE MODEL.

Contractor's model in wood and metal, on aluminum base, engraved on the base with Bendix and Grumman logos, and "Eagle," 20 x 3-1/2 inches diameter, excluding stand, in custom wood box. Traces of felt residue from box adhering to fuselage.

Provenance:

Manufactured by a major aerospace model shop.

The AAM-N-10 Eagle missile was developed by Bendix for the U.S. Navy, and manufactured by Grumman for testing in 1961. It was intended to be launched from a carrier-based Douglas F6D "Missileer" aircraft, and would have a range of 160 nautical miles. The Navy cancelled the Missileer project before the missile was even tested, and without the aircraft that it was intended for, it was never put into production.

\$2,000 - 3,000

15

GRUMMAN TFX(N) CUTAWAY MISSILE DESIGN MODEL.

Model in wood and metal, with cutaway details and labeled sub-assemblies, on painted wooden stand, with aluminum plaque engraved with Grumman logo, "TFX(N) Missile — Design 327" and the words "Confidential" at top and bottom, 39 inches x approximately 3-1/2 inches diameter main fuselage, in custom wooden box.

Provenance:

Manufactured by a major aerospace model shop.

In February 1961 Secretary of Defense Robert McNamara directed the Air Force and Navy to undertake a joint effort to develop an aircraft to meet both of their requirements. Dubbed the Tactical Fighter Experiment (TFX), the contract for what was to become the F-111 was awarded to General Dynamics, opening up an opportunity for design of weapons systems for the new aircraft by other contractors. This design would probably have been an air-to-air missile proposal for the F-111. Disputes between Air Force and Navy requirements for the F-111A and F-111B led to the abandonment of the latter, and the eventual development of the F14 Tomcat by Grumman to meet the Navy's requirement.

\$1,500 - 2,500



13



14



15



16

16

GRUMMAN HAWKEYE W2F-1 MODEL.

Mood and medal model, with glass base, early 1960s, marked on the base with a Grumman logo and titled "W2F-1 Hawkeye," 20 x 14 x 7-3/4 inches.

Provenance:

Manufactured by a major aerospace model shop.

The Northrop Grumman E-2A Hawkeye, originally designated W2F-1 during development, is a carrier-based early-warning radar plane that has been in use since its introduction in 1962. Its numerous versions have been utilized by the U.S. Navy and Coast Guard, as well as by Egypt, France, Japan, Mexico, Singapore and Taiwan.

\$2,000 - 3,000



17

17

GRUMMAN A7 PROTOTYPE MODEL.

Hand-crafted painted wooden model on glass base, of a Grumman A7 jet proposal, in U.S. Navy livery, c.1963. The base is marked "Grumman Design 128 - G-12." 20-3/4 x 20 x 6 inches, excluding base.

Provenance:

Manufactured by a major aerospace model shop.

In 1962 the U.S. Navy began looking for a replacement for the A-4 Skyhawk, a subsonic, carrier-based attack plane. They asked Vought, Douglas Aircraft, and North American Aviation to submit designs based upon existing aircraft. This model represents Grumman's proposal, a single-seater based upon the two-seat A-6 Intruder that was introduced in 1963. In the end, the Navy chose Vought's design, the A-7 Corsair II.

\$2,000 - 3,000



18

18^W

JET AIRCRAFT ASSEMBLY LINE MODEL.

Consisting of two aircraft models — an A6 Intruder and an F14 Tomcat — on a model assembly line with robotic assembly tools. Wood, metal, plastic and resin, contained in a wooden fitted box, with two luggage-style handles on either end of the base for removal from the box, marked "Property Industrial Engineering." Scale not specified. Dimensions of base of model, 41 x 12-1/2 inches.

Provenance:

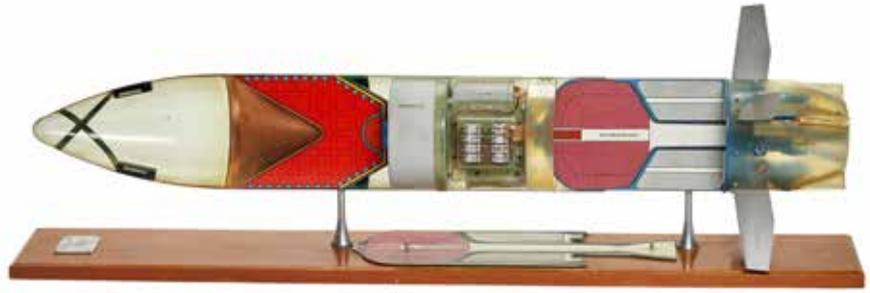
Manufactured by a major aerospace model shop.

\$1,500 - 2,500

19

RANGER INFANTRY HEAVY ASSAULT CUTAWAY MODEL.

Half-fuselage model with translucent plastic exterior hull, wood and metal interior parts, on a wooden base, with painted color-coded details of interior portions of the missile, aluminum plaque on base with Grumman logo, titled "Ranger Infantry Heavy Assault Missile," 43-1/4 inches long by approximately 6 inches diameter, in wooden box.



19

Provenance:

Manufactured by a major aerospace model shop.

Evidently a Grumman proposal for an anti-personnel missile, showing the components and systems of the missile design. No design bearing this designation was ever utilized.

\$2,000 - 3,000

20

NORTHROP M2-F3 REACTION CONTROL THRUSTER.

ORIGINAL THRUSTER ROCKET FOR JOINT NASA/NORTHROP LIFTING BODY PROJECT. Various alloys with plastic nozzle, 8 3/4 inches tall, 1967-1973, with NASA Flight Research Center tag and receipt.

The M2-F3 (M for Manned, F for Flight) lifting body aircraft was a joint project of Northrup along with the engineers at NASA's Flight Research Center, Ames Research Center and the Air Force. The lifting body is essentially a wingless aircraft that used the lift provided by the fuselage shape and would allow the pilot to land in a horizontal mode — a concept that was to aid the spacecraft of the future. The M2-F3 was a rebuild of the earlier M2-F2 which had crashed in May 1967. Among the additions on the updated vehicle was a reaction control system which utilized thrusters, such as the present example, to provide attitude control and sometimes translation. It was a system similar to that of orbiting spacecraft and was likely borrowed from that realm. The vehicle made 27 flights before it was donated to the Smithsonian Institution in December 1973.



20

\$3,000 - 5,000

21

GRUMMAN AEROSPACE ELECTRONIC WARFARE TEST RANGE MODEL.

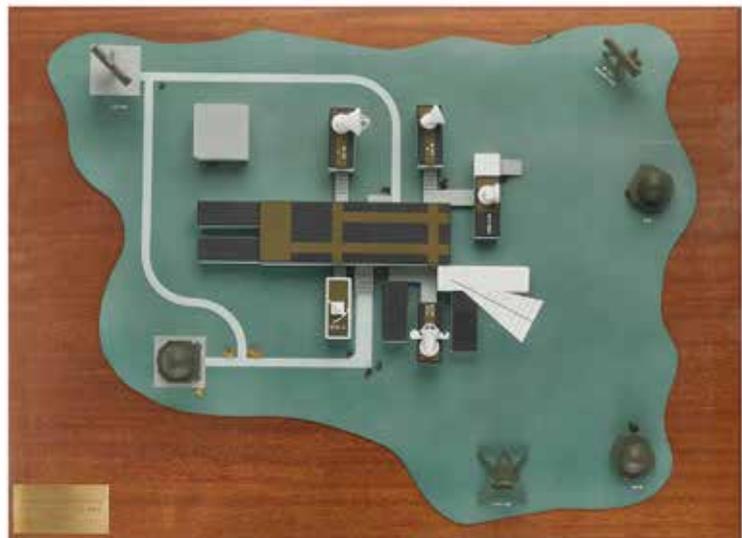
Diorama type model of a building compound and components of the test range, on a wooden base, 1/96th scale, with plexiglass cover, 31 x 31 x 6 inches, in custom wooden case.

Provenance:

Manufactured by a major aerospace model shop.

Proposal for the layout of an electronic warfare test range by Grumman Aerospace.

\$800 - 1,200



21



22

22

GRUMMAN S-2T TURBO TRACKER WOODEN MASTER MODEL.

Master model in painted wood, approximately 1/12th scale, with detachable wings and propellers, 72-1/2 inch wingspan, 43-3/4 inch length. Lacking one exhaust duct, minor chipping around nose.

Provenance:

Manufactured by a major aerospace model shop.

The S-2 Tracker was first deployed as a military plane in 1952, for anti-submarine warfare. Variants of this design saw service with the U.S. military until the mid-1980's. The S-2T version was powered by two Garrett turboprop engines, and is still in service today with foreign navies and in firefighting applications.

\$3,000 - 5,000



23

23

AIR FORCE ONE.

ORIGINAL LOCKHEED AIRFORCE ONE CONCEPT ART BY OTTO KUHNI.

Collection of 7 illustrations, one signed ("O. Kuhni"), gouache on board, 30 x 30 inches and 19 1/2 x 24 inches, most with vellum overlay with penciled notes, 6 with Lockheed label, one depicting a view of Air Force One in flight and the remaining depicting interior views.

Although Franklin D. Roosevelt was the first president to fly in an aircraft while in office and to have a specific aircraft assigned to him, it wasn't until an incident in 1953 when President Eisenhower's plane, Air Force 8610, crossed paths with a commercial flight, Eastern Air Lines 8610, that the need for a special designation was realized. That aircraft, a Lockheed VC-121A-LO Constellation, became the first to use the Air Force One callsign.

The above selection of Lockheed concept designs for Air Force One are undated, but appear to be from a 1960s / early 1970s bid to win over the contract from Boeing, who had supplied all Air Force One airplanes after the original group. They depict the jet in flight, staff seating, the sleeping quarters, an office space, guest quarters, a conference room, and guest and staff seating. The depiction of Air Force One in flight is signed by celebrated illustrator Otto Kuhni, also known for his Hot Wheels designs.

\$2,000 - 3,000



24

24

GROUP OF ORIGINAL ILLUSTRATIONS OF LOCKHEED PLANES.

9 gouache on board illustrations by Otto Kuhni, c.1979, various sizes (488 x 610 to 505 x 760 mm), one with additional celluloid overlay, 4 showing exteriors of jets in flight, 3 of plane interiors, many with Lockheed Corp. labels to paper overlay or verso, minor waterstaining to Dash 400 design.

A group of Lockheed artwork by graphic designer Otto Kuhni (best known for his packaging design for Mattel), including in-flight views of three never-built Lockheed designs: the Twinstar, the Dash 400 and the Dash 600. Images also include an inflight view of an Ecuatoriana Airlines jet, two interior views of an Air Algerie private jet, and an interior boardroom view of a Saudi Royal aircraft.

\$1,500 - 2,500

25

GRUMMAN X-29 CONTRACTOR'S MODEL.

Contractor's model in painted wood on wooden stand, marked only "Grumman" on tail fin. Scale not specified. 24-1/2 x 13-1/4 x 6-1/4 inches, excluding stand.

Provenance:

Manufactured by a major aerospace model shop.

The experimental Grumman X-29 was notable for its forward-swept wings. Two prototypes were built in the 1980's and flown by NASA and the U.S. Air Force. The extensive use of carbon fiber composites and fly-by-wire controls introduced important new technologies in aircraft design, and although the X-29 was never intended to be a production aircraft, its design was influential on future aircraft development. The two original prototypes are currently housed at the National Museum of the U.S. Air Force at Wright-Patterson Air Force Base, and the Armstrong Flight Research Center at Edwards Air Force Base.

\$2,000 - 3,000

26

PICCARD TRIESTE BATHYSCAPHE MODEL.

Wood, resin and metal model, with detachable spherical observation gondola, on wooden base, 28-1/4 x 5-1/2 x 13-1/2 inches, in wooden box. Some paint deterioration.

Provenance:

Manufactured by a major aerospace model shop.

Designed by Swiss scientist Auguste Piccard, *Trieste* was a deep-water bathyscaphe that explored some of the deepest reaches of the Pacific Ocean, in the Mariana trench. Crewed by Piccard's son, Jacques, and American explorer Don Walsh (then a Lieutenant in the U.S. Navy), *Trieste* reached a record depth of over 35,000 feet on January 23, 1960.

\$1,500 - 2,500

27

FLAGSTAFF II HYDROFOIL MODULAR CONTRACTOR'S MODEL.

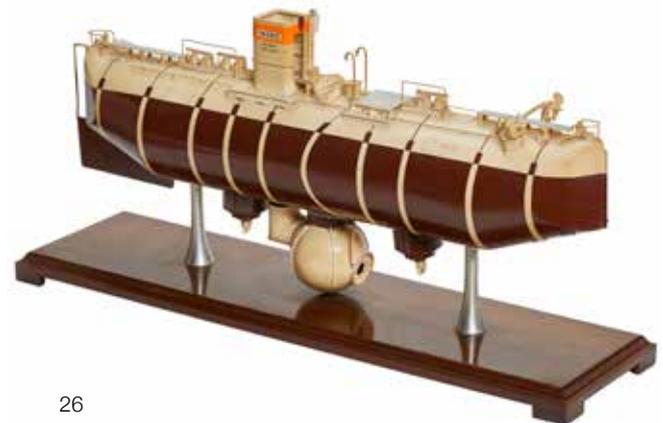
Set consisting of hull on stand, with 11 interchangeable superstructure and upper deck modules, showing different configuration possibilities, all in wood and metal, the base in wood, contained in a custom wood storage box. Hull 13-3/4 inches long, 11 inches wide.

Provenance:

Manufactured by a major aerospace model shop.

The Flagstaff hydrofoil was developed by Grumman in the late 1960s, competing with Boeing's "Tucumcari" hydrofoil for sale to worldwide naval forces. The Israeli Coast Guard was highly impressed with demonstrations of the first Flagstaff, which led to the Flagstaff II, designed specifically for the Israelis.

\$4,000 - 6,000





28

28

ISRAELI NAVY SHIMRIT HYDROFOIL CONCEPT MODEL.

In wood and metal, on wooden base, with brass plaque engraved with Grumman logo and titled "Design M-161 Israeli Navy Hydrofoil," 16-1/4 x 9 x 7 inches, in wooden box.

Provenance:

Manufactured by a major aerospace model shop.

Grumman's prototype Flagstaff hydrofoil impressed the Israeli Navy, who contracted Grumman to develop a version for them. Built by Grumman as the "Shimrit" hydrofoil, and also in Israel as the "Shlomit," they were expensive and complex, and were used only for a short time.

\$2,000 - 3,000



29

29

"NUTCRACKER" AIRCRAFT AND SHIMRIT HYDROPLANE LAUNCH VEHICLE.

Wood, fiberglass and metal model with accessories, including hydroplane and aircraft models, on wooden stand, hydroplane dimensions 37 x 6-3/4 x 12 inches, with custom wooden case and printed prospectus.

Provenance:

Manufactured by a major aerospace model shop.

Grumman proposed that that Israeli Navy, who contracted them to produce the Shimrit hydroplane, would also be interested in an aircraft that could be launched from the deck of the hydroplane. The Grumman G-674 "Nutcracker" was a folding-fuselage VTOL fighter aircraft that would fit on a smaller vessel and take off from a small platform on deck. The aft portion of the fuselage of the Nutcracker would fold down upon landing, allowing the plane to come to rest on a relatively small elevated platform with a minimal footprint.

\$2,500 - 3,500



30

30

GRUMMAN SUBMERSIBLE HYDROFOIL MASTER MODEL.

Master model in painted wood, resin and aluminum, on wooden base with brass identification plaque engraved with Grumman logo and identified as "Design #1610," 630 mm in length, 10 inches high (excluding base). Custom wooden box.

Provenance:

Manufactured by a major aerospace model shop.

A prototype design proposal for a submersible hydrofoil, evidently never produced.

\$2,000 - 3,000



31

31

GRUMMAN GSV-1 SUBMARINE MODEL.

Consisting of 2 half-hull models, in wood with metal fittings, each in a separate custom wooden box, circa 1968. Each half-hull model features a cutaway diagram of the interior chambers of the submarine on the inside surface. Each 37 x 13-1/2 inches.

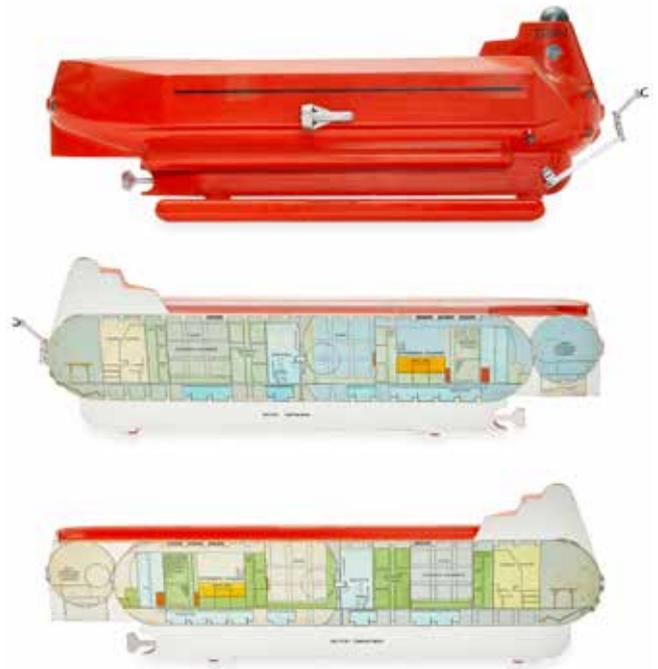
Provenance:

Manufactured by a major aerospace model shop.

Grumman developed small manned submersible vehicles in the late 1960's to meet a growing demand for these craft in both military and commercial applications. The first was the PX-15 "Ben Franklin," followed by this development of the same concept, the GSV-1.

Unlike the PX-15, no operational example of the GSV-1 was ever completed.

\$4,000 - 6,000



32

32

GRUMMAN/PICCARD PX-15 "BEN FRANKLIN" SUBMERSIBLE MODEL.

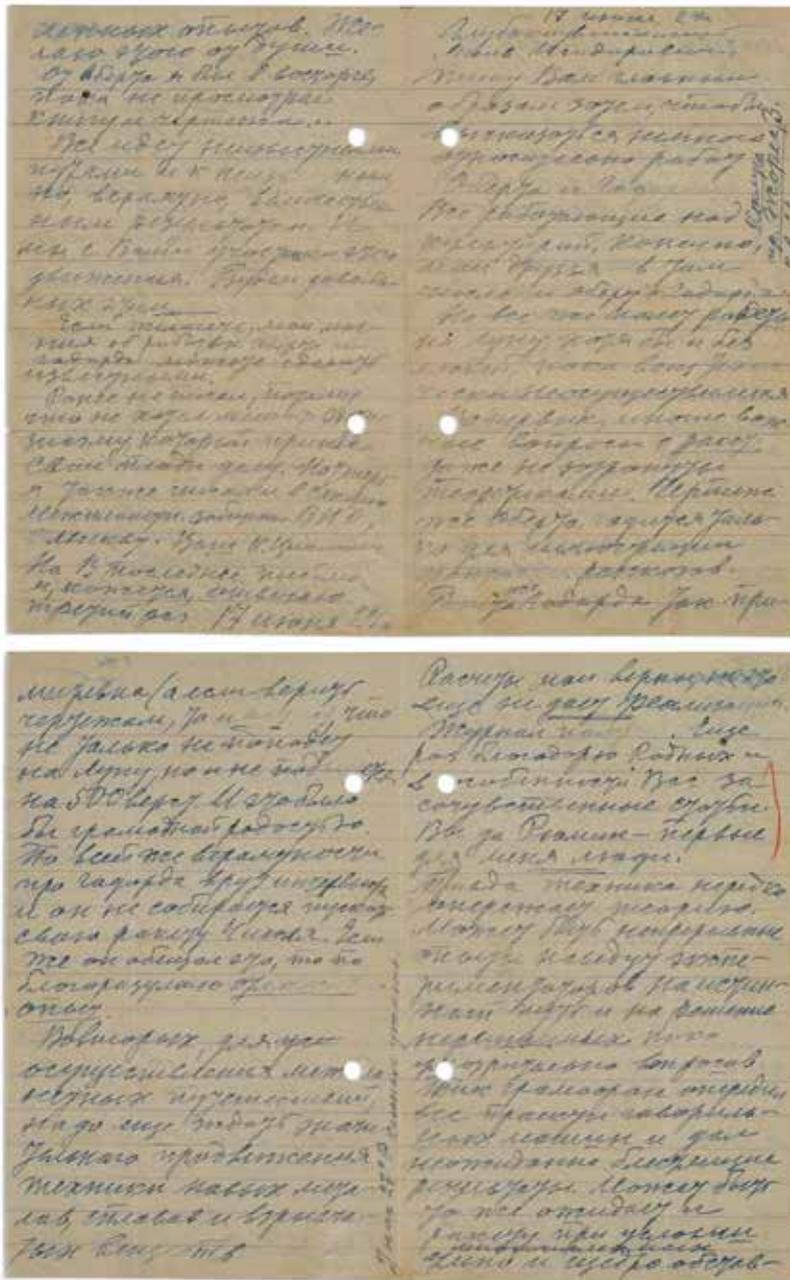
Contractor's model in painted wood with metal fittings, 20 x 10-1/2 x 9 inches, in custom wooden case.

Provenance:

Manufactured by a major aerospace model shop.

The manned submersible PX-15 (*Ben Franklin*) was first conceived by Swiss explorer Jacques Piccard and developed together with Grumman in the U.S. It was built at Piccard's factory in Switzerland, then disassembled and shipped to Florida, and sailed on a voyage from the Palm Beach area to Halifax, Nova Scotia. NASA send a scientist, Chester May, along on the mission to observe the operations inside a small enclosed vehicle, in order to gain insights into conditions of space travel. *Ben Franklin* ran aground in 1971 and was sold to a Vancouver businessman. Today it is on display outside the Vancouver Maritime Museum.

\$2,000 - 3,000



33

**33
RUSSIAN FATHER OF ROCKETRY COMMENTS ON AMERICAN
ROCKETRY PIONEER ROBERT H. GODDARD.**

TSIOLKOVSKY, KONSTANTIN. 1857-1935. Autograph Letter Signed ("K.E.Ts. & "K. Tsiolkovsky"), 4 pages recto verso of a folded leaf, 6 7/8 x 4 1/4 inches per page, Kaluga, June 17, 1924, to Yaakov Isidorovich Perelman, in Russian with translation.

The Russian/Soviet father of spaceflight here writes about his rocket science contemporaries Hermann Oberth and Robert H. Goddard. Translated, in part: "I am writing to you mainly to speak a bit about Oberth's and Goddard's work. Of course, everyone working on culture is my friend, Oberth and Goddard among them. Nevertheless, to land rockets on the moon, even unmanned, is, for the time being, technically impracticable. Firstly, theoreticians haven't addressed many important questions about rockets. Oberth's sketch itself serves only to illustrate a fantastical tale. Even Goddard's rocket is so primitive (and to trust the sketches is foolish,) that not only won't you reach the moon, you won't even rise 500 versts. And this would be greatly celebrated. Secondly, to realize planetary travel, one must still

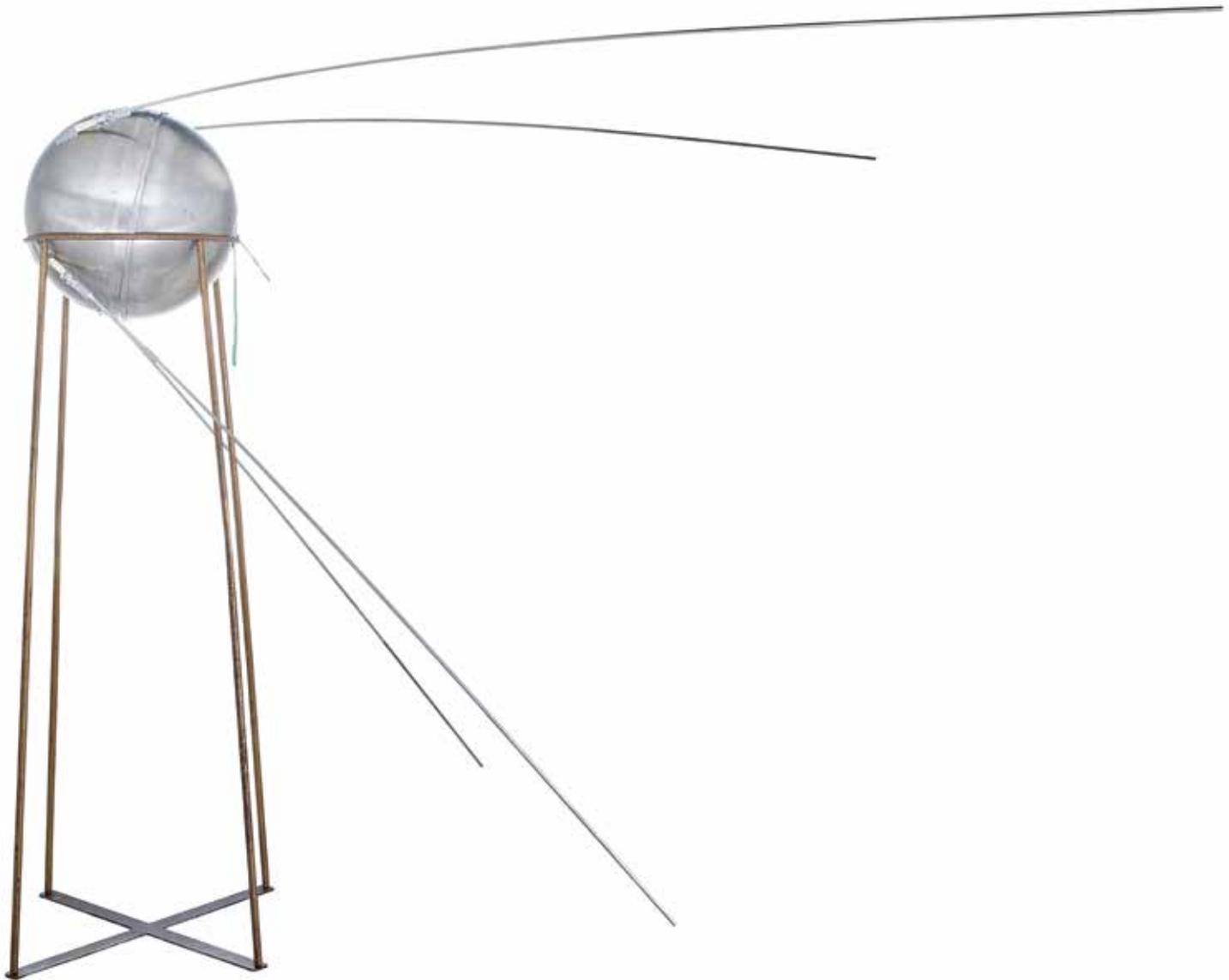
wait for important advances in the technology of new metals, alloys, and explosives..."

Tsiolkovsky had first proposed in 1895 that an artificial Earth satellite might be possible and 5 years before the Wright Brothers made their first flight at Kitty Hawk, Tsiolkovsky created a formula describing how a rocket was necessary to take to escape Earth's gravity. He was highly regarded by Chief Designer of the Soviet space program Sergey Korolev. Korolev had pushed to launch Sputnik-1 on September 17th, 1957, Tsiolkovsky's centennial birthday and although the actual launch was a few weeks later, it was still in Tsiolkovsky's honor. Korolev, after the successful launch of Sputnik-1 into orbit is quoted as saying: "Today we have witnessed the realization of a dream nurtured by some of the finest men who ever lived, including our outstanding scientist Konstanin Eduardovich Tsiolkovsky" (Dickson p.107). Dickson *Sputnik: The Shock of the Century*, 2001.

\$10,000 - 15,000

“Listen Now,’ said the NBC radio network announcer on the night of October 4, 1957, ‘for the sound that forevermore separates the old from the new’”

(Dickson p 1).



"To me, it was as if Sputnik was the starter's pistol in an exciting new race. I was electrified, delirious, as I witnessed the beginning of the Space Age"

(Dickson pp 2-3).



34^W

SPUTNIK-1 EMC/EMI LAB MODEL, 1957.

Full scale vintage test model of the Sputnik-1 satellite, Moscow, [February, 1957], serial number "OK6-1/001/1957," with live transmitter (modern 12 volt power supply included). Polished metal sphere with 4 external antennae, approximately 23 inches in diameter on manganese brass stand with anti-static o-ring, stand approximately 57 inches (1,448 mm) tall, stand and model together approximately 78 inches (1,981 mm) tall, weighing approximately 100 lbs. Produced at the OK6-1[OKB-1], the Experimental Design Bureau-1 factory, also known as the S. P. Korolev Rocket and Space Corporation Energia along with the Moscow Electronics Institute Novaya NII-885 in 1957, sometime prior to the launch of the Sputnik-1. Complete with vintage Tesla Maj 620A broadcast receiver, approximately 24 x 18 x 13 inches (610 x 457 x 330 mm).

Provenance:

Formerly on loan and displayed at Deutsches Technikmuseum Berlin, Germany; Collection of NII-885 director Dr. Mikhail Ryazansky, by descent.

Exceptionally rare vintage test model of the Sputnik-1 satellite, one of only a few made to test ground Electromagnetic Compatibility (EMC) and Electromagnetic Interference (EMI) testing. There are only a handful of known vintage examples of the Sputnik-1: three in private hands (including two sold in these salerooms in 2016 and 2017), one just outside Moscow at the Energia Corporate Museum, and one at the Museum of Flight in Seattle, Washington which does not have the internal components of that at Energia Corp. An impressive artifact from the dawn of the space age and this example with excellent provenance.

The Sputnik-1 artificial satellite was launched into Earth orbit by a R7 Semiorka rocket on October 4, 1957. The satellite had several scientific objectives: test the method of placing an artificial satellite in Earth orbit; provide information on the density of the upper atmosphere; test radio and optical methods of orbital tracking; determine the effects of radio propagation through the atmosphere; and check principles of pressurization used on satellites. The present model was used for testing by NII-885, a company under the Soviet Ministry of the Radio Industry that was also responsible for ground guidance systems, telemetry systems and radar homing devices for surface-to-air missiles, and the company that designed the Sputnik's transmitter. Testing would have been rigorous as Sergei Korolov, the lead Soviet rocket engineer who headed the Sputnik-1 project, insisted that the transmission be received even by those with the cheapest of radios.

The successful launch of Sputnik-1 sent the United States population into a panic. In the midst of a cold war, the Soviets demonstrated that they had a rocket powerful enough to send a satellite into orbit. "There was a sudden crisis of confidence in American technology, values, politics, and the military. Science, technology, and engineering were totally reworked and massively funded in the shadow of Sputnik. The Russian satellite essentially forced the United States to place a new national priority on research science, which led to the development of microelectronics.... Many essential technologies of modern life, including the Internet, owe their early development to the accelerated pace of applied research triggered by Sputnik" (Dickson. *Sputnik: The Shock of the Century*. New York: Walker, [2001]) p 4.

\$400,000 - 600,000



35



37



36

35

SPUTNIK-1 AWARD MEDAL.

SOVIET ACADEMY OF SCIENCE MEDAL AWARDED ONLY TO THOSE INVOLVED IN SPUTNIK-1 SUCCESS.

Circular bronze medal, 2 1/2 inch diameter, 1/8 inch thick, in Russian, on obverse: ["IN HONOR OF THE LAUNCH IN THE USSR OF THE WORLD'S FIRST SPUTNIK / 4 OCTOBER 1957"], the reverse depicting Sputnik-1 soaring above the Earth, the Soviet Union in view.

The Soviets stunned the world with the 23-inch diameter polished metal sphere that they blasted into Earth orbit on October 4th, 1957. This first successful satellite broadcast a pulse signal that any amateur radio enthusiast could tune in as it traveled overhead. The above medal has been recorded as being given 4 years after that success. Only approximately 50 examples were produced, and those only for direct participants.

\$4,000 - 6,000

36^w

R-7 SEMYORKA SPACE ROCKET MODEL.

Hand-painted, highly detailed aluminum and plastic model in two parts, with Soviet flag and Soyuz decals, plaque on base reading: "R-7 'SEMYORKA' SPACE ROCKET MODEL TsSKB-PROGRESS, SAMARA, OCTOBER, 2001," 159 cm tall including stand.

The most recognizable and frequently used of the Russian rockets, made by Samara, the factory that produces the Soyuz rockets today. R-7 was originally developed as an intercontinental ballistic missile but was used in the Russian space program starting with Sputnik and continued to the Soyuz launches, as depicted in this model.

\$4,000 - 6,000

37

LUNA 1 AWARD MEDAL.

PRESENTED ONLY TO THOSE WHO WERE PART OF THE SOVIET LUNA PROGRAM.

Circular bronze medal, 2 1/2 inch diameter, 1/8 inch thick, in Russian, on obverse: ["In Glory of Great Motherland / January 1959"], with rocket flying over the University of Lomonosov (the main Soviet scientific institution), the reverse centered with dated pentagon and quote from Russian/Soviet rocket pioneer Konstanin Tsiolkovsky: ["I believe that many of yours will be witnesses of first out of atmosphere journey"]; edged with: ["In commemoration of launch of the first in the world space rocket"].

Minted by the Moscow Mint for the Academy of Science to commemorate the first spacecraft to leave geocentric orbit. The Luna 1 was intended to strike the Moon, but due to an incorrect calculation missed and eventually also became the first spacecraft to achieve heliocentric orbit. It is speculated that as few as 30 examples of the medal were minted.

\$4,000 - 6,000

38

YURI GAGARIN SIGNED & INSCRIBED BOOK.

["I SEE HOW BEAUTIFUL OUR PLANET IS, LET US NOT DESTROY IT!"]

GAGARIN, YURI. *[A Soviet Person in the Cosmos. Moscow: April, 1961.]* 128 pages. In Cyrillic. Original printed wrappers.

SIGNED & INSCRIBED THE SAME YEAR AS HIS HEROIC FIRST FLIGHT INTO OUTER SPACE, in Cyrillic: *["Having flown around the Earth in the first satellite, I saw how beautiful our planet is, let us not destroy it! / 1, vii, 1961"]* Gagarin achieved international fame with his April 12, 1961 flight aboard the Vostok 1 spacecraft which orbited the Earth in 108 minutes before returning. This lengthy and poignant inscription was done while he was on tour, stopping in England, Brazil, Bulgaria, Canada, Cuba, Czechoslovakia, Finland, Hungary and Iceland. President John F. Kennedy had barred Gagarin from visiting the United States.

\$4,000 - 6,000

39

COSMONAUTS CELEBRATE 50TH ANNIVERSARY OF OCTOBER REVOLUTION.

GAGARIN, TITOV, NIKOLAYEV, BYKOVSKY & TERESHKOVA SIGN TO HONOR THE REVOLUTION.

Typed Letter Signed ("Gagarin," Nikolayev," "Titov," "Bykovsky" and "Tereshkova,") 1 page, 11 7/8 x 8 1/4 inches, [October 1968], to Colonel-General Vladimir Volkov, Chief of the Zhukovsky Air Force Engineering Academy.

The world's first man in space, YURI GAGARIN, the first man to spend a day in space, GHERMAN TITOV, two-time longest time spent in space ANDRIYAN NIKOLAYEV, first man to participate in a group flight into space, VALERY BYKOVSKY, and first woman in space, VALENTINA TERESHKOVA, all sign this 50th Anniversary of the October Revolution pledge to *["fulfill our duties with honor and successfully finish studying in the Academy."]* All five cosmonauts would study at the Zhukovsky Air Force Engineering Academy after their historic flights.

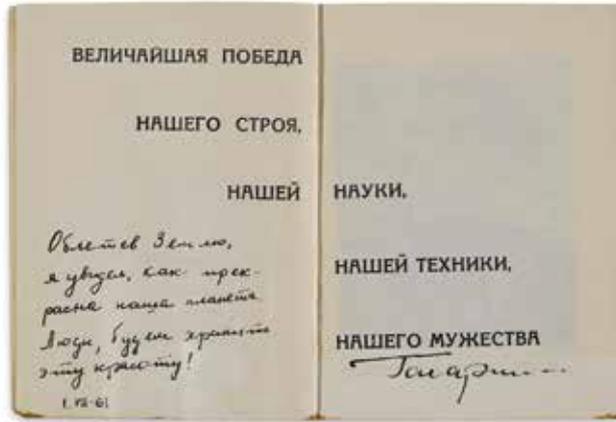
\$2,500 - 3,500

40

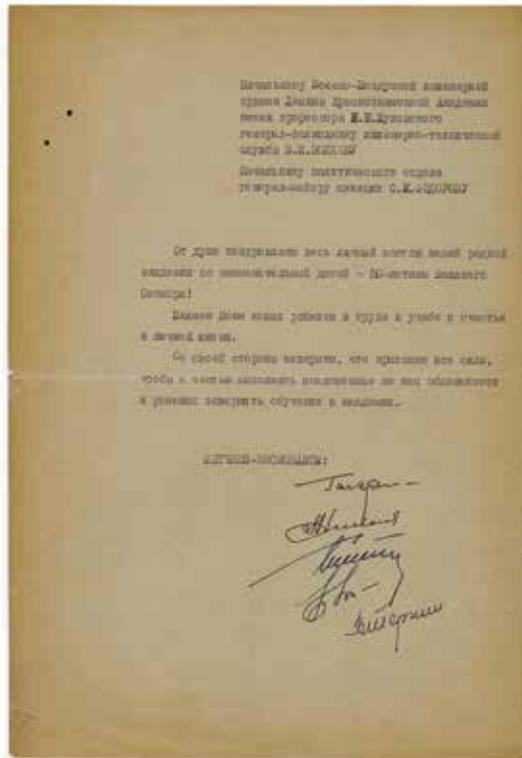
GAGARIN HONORS HEROES OF THE BAY OF PIGS.

Printed document, 1 page, signed by Yuri Gagarin as President, circa April 1965, being a card produced by the Sociedad de Amistad Societico-Cubana celebrating the 4th anniversary of Cuban victory at Playa Giron. The failed CIA-backed Bay of Pigs Invasion was a key event of the cold war. It served to strengthen the relationship of Cuba with the Soviet Union, eventually leading to the Cuban Missile Crisis. The card is also signed by I. Baskakova as Secretary General. Accompanying the document is a compliments card from the office of the Miisterio da Aeronautica Gabinete do Ministro and a printed list of Cuban officials with "Cmdte. Dr. Fidel Castro Ruz" as "Primer Ministro."

\$1,500 - 2,500



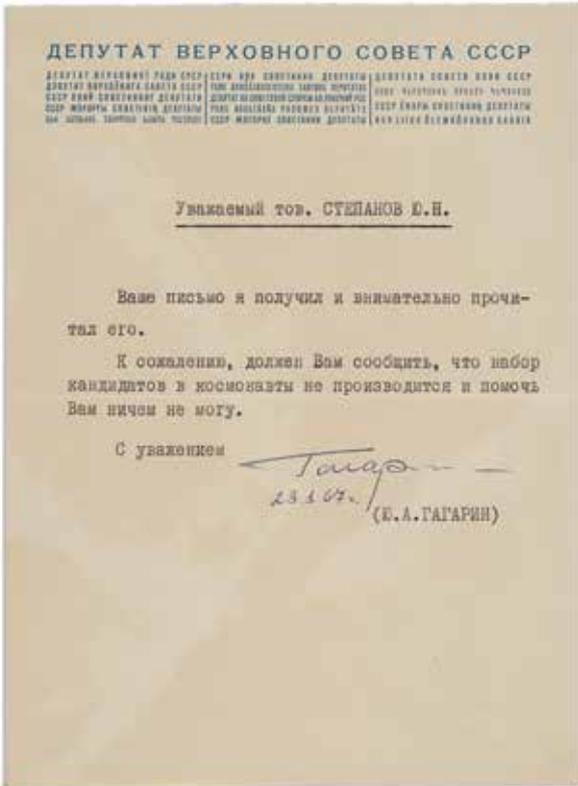
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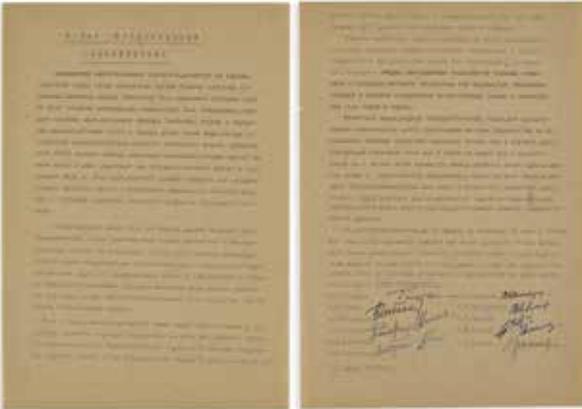
41

41

GAGARIN ON COSMONAUT RECRUITING.

Typed Letter Signed ("Gagarin") in Cyrillic, 1 page, dated 23.1.67, 8 x 6 inches, on Deputy of the Supreme Soviet of the USSR letterhead. Gagarin here informs a cosmonaut hopeful that he is unable to help as no recruitment of cosmonaut candidates is in progress.

\$1,500 - 2,500



42

42

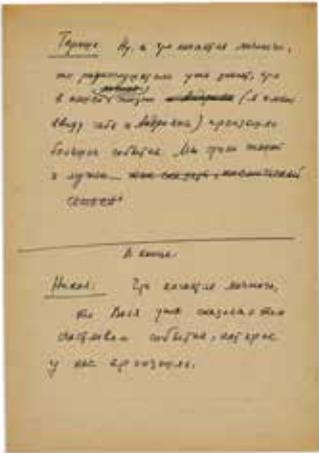
COSMONAUT PLEDGE.

YURI GAGARIN AND TEN OTHERS SIGN THIS "OPEN LETTER TO ALL HUMANITY."

Letter Signed by 11 cosmonauts, 2 pages, 11 3/4 x 8 1/4 inches, April 12, 1965, in Russian, with English translation.

11 Cosmonauts here pledge their allegiance to the Soviet Union and to "all humanity." Signers include: first person in space YURI GAGARIN, second person to orbit the Earth GHERMAN TITOV, ANDRIYAN NIKOLAYEV, first woman in space VALENTINA TERESHKOVA, PAVEL POPOVICH, VALERY BYKOVSKY, first person to die in a space flight VLADIMIR KOMAROV, KONSTANTIN FEOKTISTOV, first physician in space BORIS YEGOROV, PAVEL BELYAYEV and first person to walk in space ALEXEI LEONOV. In part: [*"To all progressive humanity! While getting over multiple difficulties, regardless of sacrifices, the Soviet people successfully built socialism by its creative labor. Contemporary powerful Soviet Union goes forward with confident tread on the road of building the material-technical base of communism, doing glorious deeds, turning the glorious Soviet country into a leading power which is in the first lines of countries of the world."*]

\$4,000 - 6,000



43

43

COSMONAUT MARRIAGE.

FIRST WOMAN IN SPACE VALENTINA TERESHKOVA ON HER MARRIAGE TO FELLOW COSMONAUT ANDRIYAN NIKOLAYEV Autograph Manuscript, 1 page, 11 3/4 x 8 inches, on the blank verso of a printed form titled "В ФОНОТЕКУ ГОСКОМИТЕТА," in Russian, being notes for a radio interview.

Tereshkova made international history on June 16, 1963 when she became the first woman to fly into space aboard Vostok 6, 2 decades before NASA would put a woman into space. Tereshkova again made international history in 1963 when she married Andriyan Nikolayev, the 3rd Soviet Cosmonaut to fly into space, on November 3rd. The present document finds Tereshkova working on two statements for a radio interview regarding the marriage.

1. "Tereshk. As for me personally, everyone knows that in our PERSONAL [CROSSED THROUGH] lifetime with Andrian (I mean myself and Andrian), a tremendous event occurred. We became wife and husband - ONE CAN CALL US A 2 STAR FAMILY [CROSSED THROUGH]"
 2. "Nicol: As for me personally, Valya has already said about that happy event, which happened in our life."
- The couple would go on to have one child, Elena Andrianovna Nikolaeva-Tereshkova, the first child of both a mother and father who had traveled into space.

\$7,000 - 10,000

44

VOSKHOD 1 COSMONAUT FEOKTISTOV HONARY DIPLOMA.

Printed Document, 2 pages, 1977, awarded to Konsantin Feoktistov, signed and stamped by 2 officials, in beige cloth gilt-lettered folder with beveled boards. * With Photograph Signed ("Feoktistov") laid in.

Space engineer Konstantin Feoktistov became the first civilian to make it into space when he flew as part of the 3-man Voskhod-1 crew. A World War II veteran, Foektistov later earned his doctorate in physics and became part of Sergey Korolev's team that designed the Sputnik satellites, the Vostok space capsule, the Voskhod space capsule and the Soyuz space capsule.

\$1,500 - 3,000



44

45

LUNA 9 SUCCESS.

HEAD OF COSMONAUT TRAINING REVIEWS LEONOV'S STATEMENTS ON LUNA 9 SOFT LANDING.

Mimeographed Document, 4 pages, approximately 11 1/2 by 8 inches, February 5, 1966, in Russian, being an early draft of article based around an interview with cosmonaut Alexei Leonov entitled "The Moon Got Closer," by Aleksei Golikov, with autograph corrections by Colonel-General Nikolai Kamanin, who signs twice.

This draft copy of an interview with Leonov regarding his thoughts on the successful landing of the unmanned spacecraft Luna 9 on the moon's surface was apparently given to Colonel-General Kamanin, the head of cosmonaut training, for his approval. Kamanin makes a few corrections, signing on page 3 and signing his approval at the article's close. Leonov mentions that the soft landing on the Luna 9 makes possible manned lunar exploration. Luna 9 was the first spacecraft to achieve a soft landing on the moon and at the time, the Soviets had still planned a manned lunar landing.

\$2,000 - 3,000



45

46^W

SOVIET VENERA-4 VENUS PROBE MODEL.

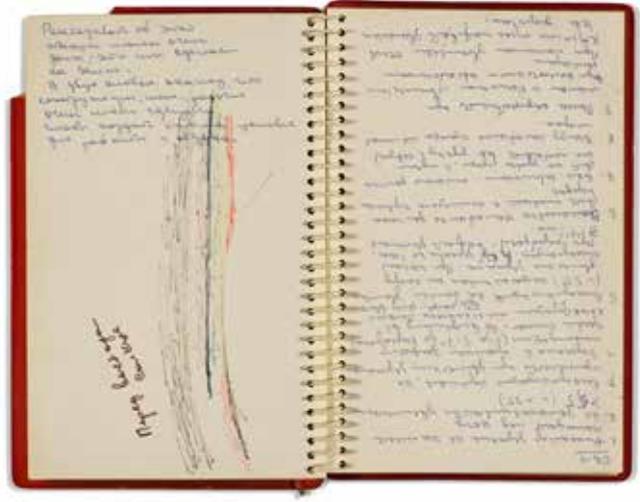
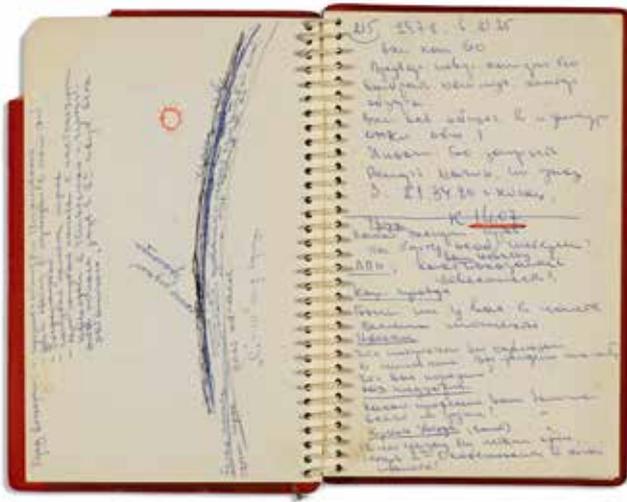
Fiber-reinforced plastic and metal 1:8 scale model on wood and metal base, with plaque on base in Russian, 470 mm high with base.

In June 1967 the Automatic Interplanetary Station, Venera-4, was launched to explore the planet Venus. It comprised an entry vehicle and an orbital spacecraft, and was the first successful probe to examine the environment of another planet. The data it sent back showed that the atmosphere of Venus consisted mostly of carbon dioxide, with nitrogen, oxygen, and water vapor.

\$6,000 - 8,000



46



47

3 SOYUZ 14 FLOWN NOTEBOOKS.

USED BY COSMONAUT YURI ARTYUKHIN ABOARD SALYUT 3.

3 items:

1. Red translucent plastic spiral-bound notebook, 7 7/8 x 5 inches, gilt Soviet emblem on upper cover, lower cover with metal mount holding 6 color marker pens, containing approximately 23 pages of autograph notes in Russian by Artyukhin.
 2. Maroon textured cloth 3-ring notebook, 6 1/4 x 8 3/4 inches, upper lettered in silver gilt ["Form 14: Descent"], red-printed title page identifying the notebook as an engineer's log for expedition 1, also containing blank radiogram form.
 3. Red translucent plastic 3-ring notebook, 6 x 8 3/8 inches, upper cover gilt stamped ["Onboard Medical Journal"] below Soviet emblem, mimeographed title-page with manuscript additions.
- All 3 notebooks stamped with Salyut 3 postmark, dated July 1974.

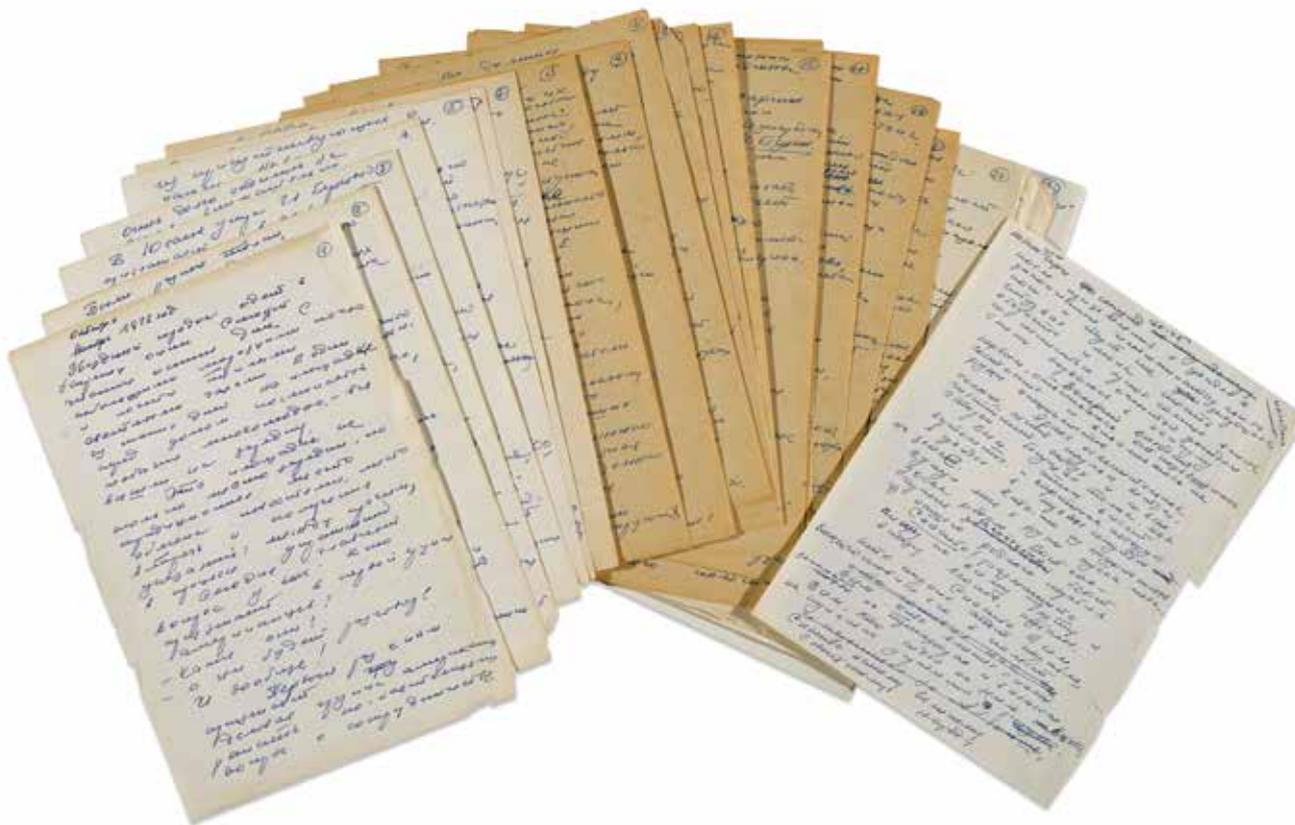
Provenance:

From the collection of Cosmonaut Yuri Artyukhin, sold at Sotheby's December 11, 1993, lot 76.

Soyuz 14 was the first successful Soviet mission to a space station. Commander Pavel Popovich and flight engineer Yuri Artyukhin boarded and spent 15 days on the space station Salyut 3. The first item listed above contains many of Artyukhin's observations and

comments while aboard the station. He makes notes regarding small improvements needed: ["1. The set with razor, brush, etc. should be at the bottom. 2. The toothpaste should not be foamy...."] Regarding tools: [2. Panel attachment should be modified. 3. Joints on the wrench should be changed."] Regarding food: ["We never warmed the food completely for lack of time ... The coffee is hot enough ... We need different juices ... Chopped chicken liver with butter is delicious. It is unnecessary to combine the fork and the spoon because the spoon is hardly needed."] Regarding exercise: 1. The treadmill needs a brake ... 3. Jumping jacks are impossible to do."] And general observations such as: ["Portholes: Too much dust on the outside. The porthole is misty with water droplets."] Artyukhin was apparently captivated by the view of dawn from space. The notebook contains 2 instances of his drawings of the phenomenon including one in colors: ["Before the dawn: the horizon and the air are dark red, then become lighter with transition to dark-blue and black. The last strip is about twice as wide as all the others together."] He also wrote replies to Soviet journalists' questions: ["The sunrise. I had heard about the dawn in space, but one has to see it to be able to appreciate its magnificence. And also, of course, the view of our beautiful earth."]

\$6,000 - 8,000



48

ALEXEI LEONOV ON APOLLO-SOYUZ.

EXTENSIVE MANUSCRIPT BY LEONOV DETAILING THE MISSION.

Autograph Manuscript, 52 pages, recto only, approximately 12 x 8 1/4 inches, in Russian, [1975], with extensive corrections and additions. * With: Autograph Manuscript Signed ("Leonov"), 1 page, 12 x 8 1/2 inches, in Russian, [c. 1995], being a statement regarding the above manuscript. * And with: 37-page photocopy of the typescript, one leaf with autograph corrections and diagram on verso in red pen.

Provenance:

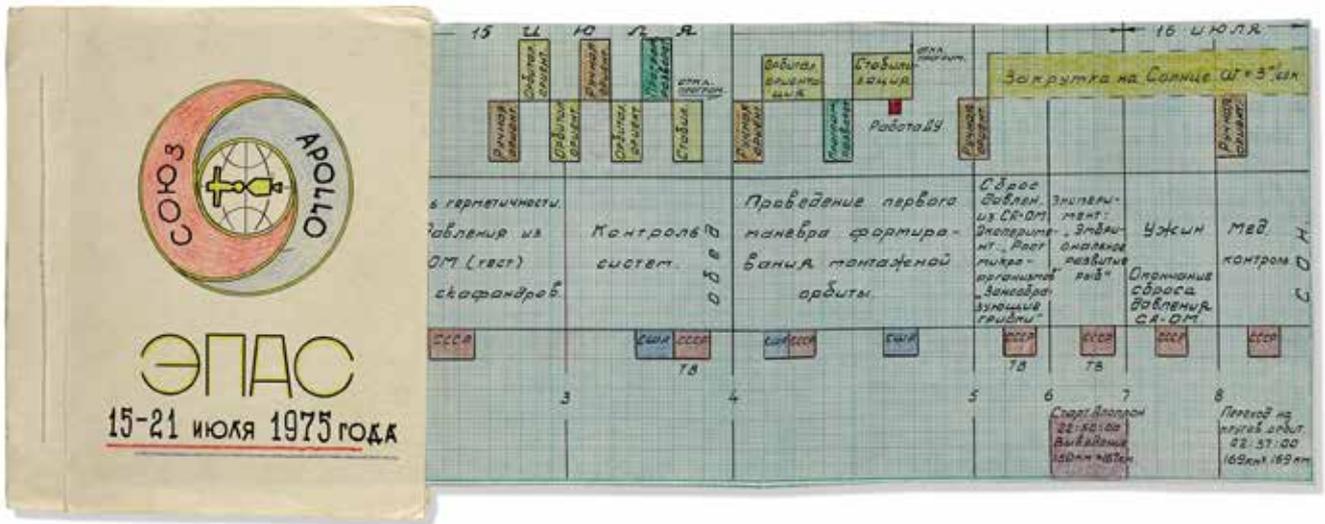
Sotheby's *Russian Space History*, March 16, 1996, lot 195, consigned directly by Alexei Leonov.

Cosmonaut Alexei Leonov here supplies a detailed account of his experiences for the Soviet-published book *Soyuz-Apollo*. Since the book had multiple contributors, only a small portion of Leonov's manuscript was included so much of the present manuscript includes unpublished material.

The manuscript opens: ["October, 1972. Star City. The small town wears the colors of autumn. The days are clear, the nights are frosty ... Everyone is unusually excited ... today's gossip is about the arrival of the Americans ... Who will be coming? What are they thinking? What are they like? For the first time Americans arrive in our country to discuss a cooperation in an area outside of economics, art or medicine."]

The most exciting portion is, of course, the Soviet-American docking in space: ["Apollo sees Soyuz at 410 km ... Apollo is approaching at three meters ... 1 meter, another instant and I shout, in English, 'Contact' ... They open the hatches ... 'Glad to see you,' I say [to Stafford]. Stafford extends his hand towards me. Here it is, the handshake in space!"]

\$20,000 - 30,000



49

APOLLO-SOYUZ CYCLOGRAM FROM GENERAL KERIM A. KERIMOV.

USED BY THE GENERAL TO FOLLOW THE ENTIRE MISSION.
 Original manuscript consisting of 7 tri-fold charts in string-bound wrappers, 6 1/2 x 5 1/2 inches with each chart unfolding to 6 x 16 inches, pen and crayon with charts on graph paper and wrappers on thicker stock, signed by Kerimov, July 11, 1975, in Russian. * With Manuscript Signed ("K. Kerimov") 3 pages, recto only, 11 3/4 x 8 1/4 inches, September 16, 1994, in Russian, being an explanation of the cyclogram.

Provenance:

From the collection of General Kerim A. Kerimov, sold by him: Sotheby's March 16, 1996. Kerimov was one of the key scientists and founders of the Soviet space program, from the launch of Sputnik-1 through to Mir.

This elaborate cyclogram was, according to Kerimov, ["prepared for the Chairman of the Soyuz-Apollo State Commission (i.e. Kerimov himself) so that he would avoid pestering flight directors with questions during the flight."] Kerimov also describes a Soyuz malfunction that was unknown at the time: ["... a malfunction 20 minutes before launch ... in the camera which would permit TV transmission during the docking. To correct it ... the flight would have been delayed. I quickly gathered members of ... the Committee. The decision was made to go ahead with the launch ... and the crew would have to correct the malfunction in flight."] The repair is indicated in pencil of the second chart between the 19th and 24th orbits. ["The crew made the repair successfully."] Kerimov further describes the cyclogram in detail including red-colored boxes in the Flight Dynamics line which refer to the "burn" of the rocket engines. An amazing overview of the mission from a central figure in the Soviet space program.

\$18,000 - 25,000



50

50

APOLLO-SOYUZ CREW MEDAL.

brass medal designed by Konstantin Dmitrievich Hrenkov, 60 mm diameter, Mytishchi, Soviet Union, 1975, made in two halves that “dock” together to form a single piece, the obverse commemorating the “First International Space Docking” in English and Russian, with the two spacecraft on opposite halves of the medal; the reverse featuring U.S. and Soviet Russian flags, and the date “1975.” Contained in white plastic case with felt-line base and clear acrylic insert.

One of only a few medals produced and identical to those actually flown and “docked” in space during this momentous occasion.

\$4,000 - 6,000

51

SOVIET COSMONAUT “PENGUIN” JUMPSUIT.

Soviet Penguin zero-gravity exercise jumpsuit attributed to cosmonaut Aleksandr Aleksandrovich Volkov. Medium blue patterned fabric with blue elasticized neck, waist, and cuffs. Embroidered patches include the State Emblem of the Soviet Union on the left breast above the pocket, Salyut program insignia on right pocket, and Soviet Russian flag with letters *СССР* on left shoulder. WITH: communication headset, as used in the Sokol-K space suits, of gray leather and white synthetic fabric mesh with suede lining, mounted with two extending microphones, with braided metal covered cable terminated in aluminum connector.

The Penguin jumpsuits were fitted with elastic tensioners and straps to supply resistance in order to combat muscle atrophy and loss of bone in zero gravity conditions during long missions in orbit. Cosmonaut Aleksandr Volkov served three missions, to the Salyut 7 on a 64-day trip, and twice to the Mir Space station for a combined 326 days. Certainly a good candidate for the Penguin suit!

\$2,000 - 3,000



51



52



52

FLOWN RUSSIAN SPACEFLIGHT BANNERS.

2 Russian banners with in-flight cancellations, SIGNED by Cosmonauts, including:

1. Soviet Committee of War Veterans banner in red silk with yellow cord border and fringe, 405 x 275 mm (excluding fringe), depicting a veterans monument and Order of the Great Patriotic War. SIGNED by Cosmonauts Berezovoy, Lebedev, Popov, Serebrov and Savitskaya of Soyuz T-5 and T-7. Stamped with 3 Salyut 7 ink cancels.
2. Mir Space Station banner in blue fabric, printed in red, white, blue and silver, 215 x 137 mm, with red, white and blue corded border and tassel. SIGNED in white areas by Cosmonauts Padalka, Afanasyev, Bella and Avdeyev, and French astronaut Claudie Haigneré. Stamped with red ink Mir on-board cancel on recto and 5 stamps on verso.

\$1,000 - 2,000

53

COLD WAR RUSSIAN BOMBER RESEARCH MODEL.

Hand-made Russian bomber master model, in grey painted wood, mid-1970s, length 16-1/2 inches.

Provenance:

Manufactured by a major aerospace model shop.

This model was made using U.S. Spy satellite photos to assess the capabilities of Soviet aircraft designs. The aircraft in question was probably a prototype of the Topolev Tu-22M, which began testing in 1973, but was not deployed until the beginning of the 1980's.

\$2,000 - 3,000



53

54

RUSSIAN ORLAN SPACE SUIT GLOVES.

In beta cloth over metallic polyester film, with nylon pressure suite lining, approximately 390 mm in length, with dark green silicone rubber fingertips and pebbled pads on inner hand surfaces. Velcro closure on back of hand, aluminum pressure fitting inside at wrist, printed pressure/time chart on wrist of right glove. Stamped at wrist of both gloves "ГП-10K-2-" followed by serial numbers which have been obscured with black ink.

The Orlan space suit was developed for extra-vehicular activity, from the Krechet suit, which was designed for lunar surface exploration. Orlan suits of various models saw service from 1977 to 1998 on Salyut, Mir and the International Space Station.

\$2,000 - 3,000

55

No Lot



54



56^W

CIAM/NASA WIND TUNNEL MODEL, 1991.

Fiberglass test model, 126 inches in length, approximately 8-1/2 inches in diameter. Rotating tail fins. Contained in a white-painted metal custom-fitted transport case with red "NASA" lettering.

Provenance:

Previously in the collection of Professor Alexander Roudakov, scramjet rocket engineer.

The collapse of the Soviet Union opened doors for Russian-US scientific collaboration with CIAM's (Russian Central Institute of

Aviation Motors) promising work on scramjet technology in the HFL Kholod project. NASA backed the project from 1994-1998 with the missile reaching about Mach 6.5 during the final test – at the time the fastest vehicle to fly within the Earth's atmosphere. The present wind-tunnel model predates the collaboration on the HFL Kholod, but was a step along the way to that record-breaking achievement.

\$25,000 - 35,000

57

No Lot



58^W

PROTON-M ROCKET MODEL.

Duralumin D-16 1:40 scale model, 160 cm in height, on wood and metal stand, in Roscosmos livery with Russian Federation flag, with Briz-M upper stage. Probably made by Khrunichev, after 1992.

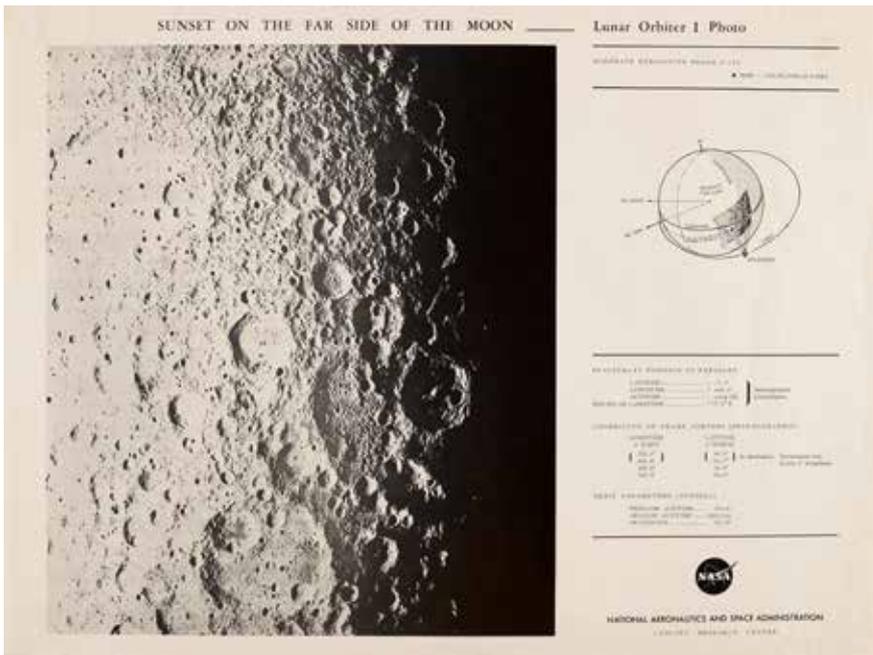
A highly detailed model of impressive size, used for exhibition either by the Russian space corporation Roscosmos, or the rocket's manufacturer, Khrunichev. The Proton-M heavy-lift launch vehicle was first launched in 2001 and has since seen over 100 launches putting satellites into orbit. The Briz-M upper stage is the most commonly used, using its propulsion system to achieve orbital injection and place the satellite payloads.

\$4,000 - 6,000

United States Space Program

Lots 59-156





59

59

LUNAR ORBITER MISSION A.

- 4 photographs and official prints, comprising:
1. Two composites of Lunar Surface photographs from the mission, gelatin silver prints, assembled with tape on verso, 430 x 480 mm each.
 2. *USAF Lunar Surface Mosaic*, 1962, 430 x 477 mm.
 3. *Sunset on the Far Side of the Moon*,[®] NASA publication, undated, 455 x 607 mm. All with creases and handling wear.

\$1,200 - 1,800

60

LUNAR ORBITER MISSION II.

- 5 items related to lunar photography from Orbiter Mission II, including 3 official NASA photographs, gelatin silver prints, 8 x 10 inches, numbered L-66-9890, L-66-9823, and L-66-9788; 1 unnumbered photo of Mariner Hills on the Lunar Surface; and a photostatic copy on NASA letterhead of a congratulatory letter to the Mission staff from Cliff Nelson and Lee R. Shaw. All laid down to tissue paper backings with typed captions for each photo on a separate sheet.

Cliff Nelson was the head of NASA's Lunar Orbiter Project Office. The layout of these photos with descriptive captions taped to heavy tissue sheets suggest they were used for a presentation, possibly on a flip chart.

\$1,200 - 1,800

61

LUNAR ORBITER MISSION III.

- 8 items, including:
1. Seven composites of Lunar Surface, gelatin silver prints, on photographic paper, taped together on verso, various sizes.
 2. Panoramic image of Earth looking across Lunar Surface, 1966. Left margin with damage to image from liquid contact.

\$2,000 - 3,000



60



61

62

LUNAR ORBITER MISSION IV.

Group of 7 items, comprising 5 composite images of lunar surface, made from sections of photographic prints taped together, and 2 published NASA photographs of the lunar surface, 1 from frame 152, site 27 N, dated 22 March 1967, and 1 from frame 187, site 33 B, dated 25 May 1967, various sizes.

\$2,000 - 3,000



62

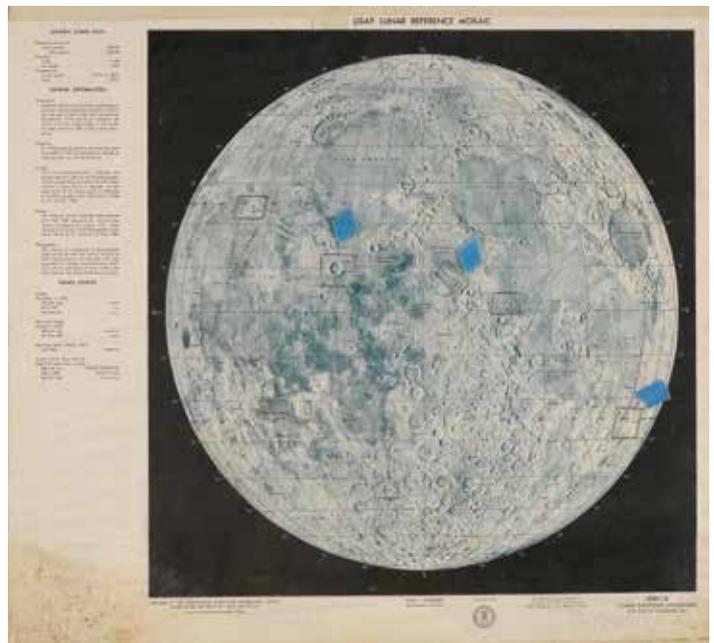
63

LUNAR ORBITER PHOTOS.

13 pieces, comprising:

1. Two composite photographs of the Lunar Surface, gelatin silver prints, assembled with tape on verso.
 2. Four official NASA prints from Lunar Orbiter missions, gelatin silver prints, 16 x 20 inches, including V-34 H 3, V-151 M, V-97 M, and V-198 M.
 3. *Earthrise from Moon's Orbit*, NASA, 1966. The first image transmitted back to Earth depicting the Earth from a point beyond the Moon's orbit.
 4. *Geometrical Perspective of First Earth-Moon photo*, NASA, n.d.
 5. *USAF Lunar Reference Mosaic*, 1962, 430 x 477 mm.
 6. Photograph of Bell experimental aircraft, black and white official Bell publicity photo, 10 x 14 inches.
 7. Photograph of Atlas-Agena rocket launch, color print, 10 x 14 inches.
- All with slight creasing and wear, USAF print with foxing to surface.

\$1,200 - 1,800



63

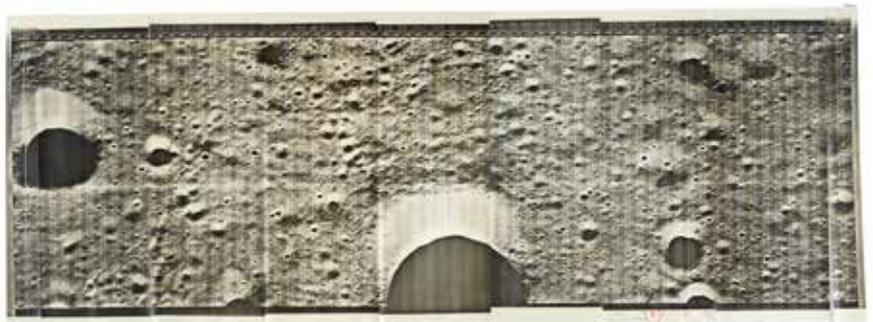
64

COMPOSITE LUNAR SURFACE PHOTOGRAPH.

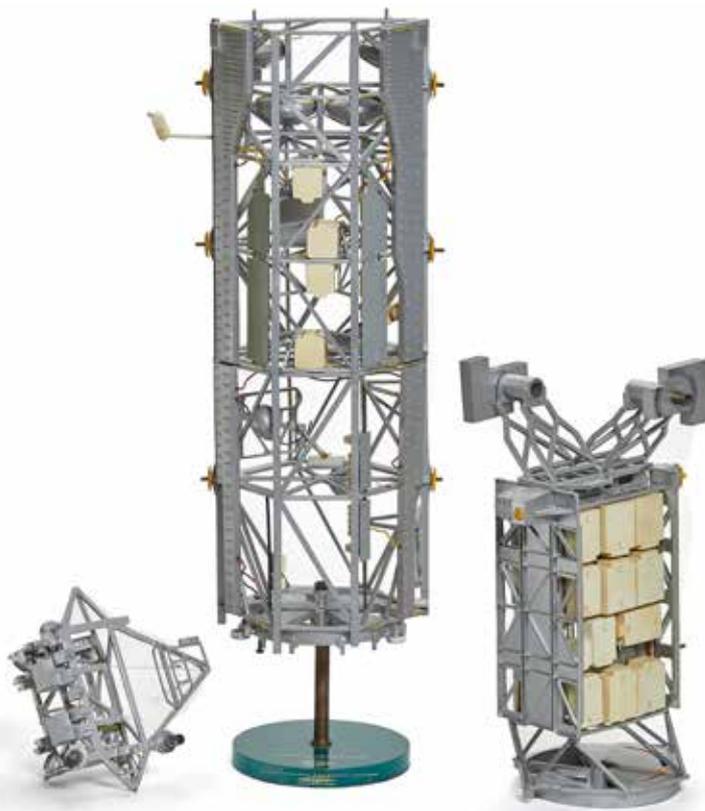
Composite photographic print of Lunar surface, comprised of 9 segments, connected by tape (some connections separated), 466 mm x 1,240 mm. Notation at lower margin "At first these were thought to be structures" with red arrows indicating irregular shapes on the surface.

These composite Lunar surface photographs show anomalous geometric shapes that some suggested might be structures produced by humans or other intelligent life forms. Although no actual structures have ever been confirmed on the Lunar surface, conspiracy theories have persisted. These rare images show an early source of such theories, taken by NASA from Lunar orbit.

\$5,000 - 7,000



64



65

65

ORBITAL RESEARCH VEHICLE ENGINEERING MODEL.

Engineer's model of launch apparatus for an orbital vehicle, in plastic, foam, wood and metal, with several modules, 1960s, with evidence of having been disassembled and re-assembled in various configurations, approximately 21-1/4 inches high.

Provenance:

Manufactured at a major aerospace model shop.

The Solid Controlled Orbital Utility Test (SCOUT) vehicle program sprung from America's response to the launch of the Soviet Sputnik satellite in 1957. The purpose was to develop a reusable launch vehicle for the Space Race, using technology that was readily available and easy to implement quickly. Eclipsed by the later Titan and Saturn rockets of the manned space program, the SCOUT development program of the early 1960's hastened the U.S. entry into orbital missions and eventually the moon landings.

\$800 - 1,200

66

ASTRONAUT-SIGNED MERCURY BLUEPRINT.

SIGNED BY 3 OF THE MERCURY SEVEN AND MERCURY DESIGNER MAX FAGET. Mercury Blueprint, Signed ("Wally Schirra," "M. Faget, Mercury Designer" "Gordon Cooper, Faith 7" and "Scott Carpenter"), approximately 35 x 53 inches, 1/10 scale, Goodyear Aircraft Corporation, Akron, Ohio, November 1961, entitled "Escape Concepts," folded.

An interesting proposal for an ejection seat in the Mercury capsule. Designer Maxime Faget also developed the idea of the Launch Escape System (LES) where a rocket was used to remove the capsule from the launch vehicle. Although ejection seats weren't used for Project Mercury, they were used on Project Gemini.

\$4,000 - 6,000

67

MERCURY 7: CARPENTER SIGNED ORBIT CHART.

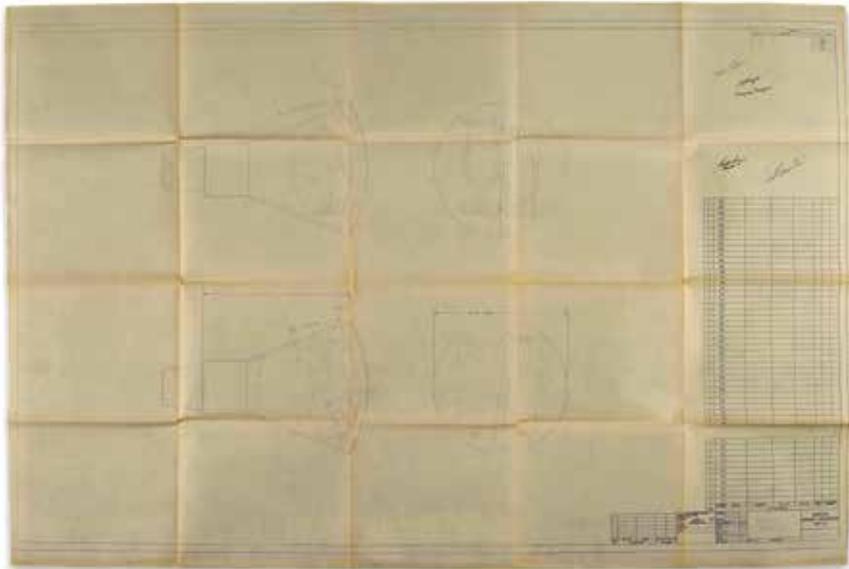
Mercury Orbit Chart MOC-3. USAF Aeronautical Chart and Information Center, December 1961. 242 x 874 mm. SIGNED AND INSCRIBED near upper right corner *Scott Carpenter — Mercury 7 — 24 May 1962.* Rolled.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, from the Defense Mapping Agency. Mercury-Atlas 7, the fourth Project Mercury flight, was the first NASA manned space flight to focus on scientific information-gathering, rather than overcoming the technical obstacles of orbital flight.

\$800 - 1,200



66



67

68

THE ORIGINAL MERCURY SEVEN IN SPACE SUITS, SIGNED.

Large color photograph, 20 x 16 inches.

BOLDLY SIGNED by SCOTT CARPENTER, GORDON COOPER, and WALLY SCHIRRA. Cooper has added: "The Original Seven" at the upper left corner.

The historic photograph of all seven Mercury astronauts in their silver space suits. The front row has (left to right) Wally Schirra, Donald Slayton, John Glenn, and Scott Carpenter. The back row (left to right) features Alan Shepard, Virgil "Gus" Grissom, and Gordon Cooper.

\$1,000 - 1,500

69

GEMINI 1/8 SCALE MODEL.

RARELY SEEN LARGE SCALE CONTRACTOR'S MODEL.

4-part model of painted composites, plastics, metal support, 30 inches tall, 15 inch diameter at base, [1964], being a 1/8 scale model of the Project Gemini capsule including the reentry, retro and equipment modules.

Although Gemini began as Mercury Mark II, it developed into a much more sophisticated vehicle with its modular structured capsule consisting of the reentry module which contained the two astronauts in their ejection seats; the retro module which contained 4 retrorockets used for both reentry, but also in case of abort procedures during lift-off to separate the capsule from the Titan rocket; and the equipment module which allowed for docking in space with the Agena Target Vehicle.

The master mold for the retro module portion of this model was sold in these rooms in 2009, having been built by the Engineering Model and Mock-Up Division of Atkins and Merrill, Sudbury, MA. This complete model was evidently produced in limited numbers as it rarely appears on the market.

\$3,000 - 5,000

70

GEMINI TITAN II ROCKET MODEL.

A 1:36 scale model, resin composite, 36 inches tall on 10 x 8½ x 2 inch wooden base. Base with brass plaque reading "Gemini Titan," and impressed NASA meatball logo in red, white and blue, c.2000.

SIGNED and INSCRIBED on capsule: *JIM MCDIVITT. GEMINI IV COMMANDER.*"

\$1,500 - 2,500



68



69



70

73

GEMINI 12 CREW SIGNED ORBITAL CHART.

Gemini Mission Chart (GMC) 12.
335 x 890 mm. SIGNED by both members of the crew: "Buzz Aldrin — Gemini XII PLT — November 1966" and "James Lovell — Gemini 12 CDR." Rolled.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, from the Defense Mapping Agency. Gemini 12 was Lovell's second Gemini mission, and Aldrin's rookie space mission. Both graduated to the Apollo program, with Aldrin making history as the second man on the moon, while Lovell's intended moonwalk with Apollo 13 was destined never to happen.

\$1,000 - 2,000

74

GEMINI: COLLECTION OF SIGNED PHOTOGRAPHS.

INCLUDES 12 PHOTOS HAVING 20 ASTRONAUT AUTOGRAPHS.

Collection of color 8 x 10 photographs comprising:

1. Gordon Cooper in his white Gemini space suit and helmet. SIGNED and INSCRIBED: "GORDON COOPER, Gemini V."
- 2) The Gemini Titan 5 launch. SIGNED and INSCRIBED: "CHARLES CONRAD, GT-5 PLT" and "GT 5 Launch, GORDON COOPER, Aug 65."
- 3) Conrad in the recovery helicopter. INSCRIBED and SIGNED: "Gemini V Recovery, CHARLES CONRAD."
- 4) Conrad and Cooper on the recovery ship. SIGNED and INSCRIBED: "CHARLES CONRAD, PLT" and "GORDON COOPER, GT 5 CDR."
- 5) Portrait of Gemini 6 astronauts Stafford and Schirra in their white space suits. SIGNED by TOM STAFFORD and WALLY SCHIRRA.
- 6) A close-up view of the Gemini 7 spacecraft in earth orbit during the Gemini 7/6 rendezvous and fly-around. SIGNED by TOM STAFFORD and WALLY SCHIRRA.
- 7) Stafford and Schirra just after they exit their Gemini 6 spacecraft on the deck of the USS Wasp. SIGNED and INSCRIBED: "TOM STAFFORD, Gemini 6 Recovery" and SIGNED by WALLY SCHIRRA.
- 8) Stafford and Schirra exit a military air transport after their Gemini 6 flight. SIGNED by TOM STAFFORD and WALLY SCHIRRA.
- 9) An official NASA portrait of the Gemini XI astronauts in blue aircraft flight suits. SIGNED and INSCRIBED: "RICHARD GORDON, GEMINI XI PLT" and "CHARLES CONRAD, Gemini XI Cdr."
- 10) Close-up of Conrad in his white space suit. SIGNED and INSCRIBED: "CHARLES CONRAD, Gemini XI Cdr."
- 11) The Gemini XI astronauts on the recovery ship just after splashdown and the end of their space flight. SIGNED and INSCRIBED: "RICHARD GORDON, GEMINI XI PLT" and "CHARLES CONRAD, Gemini XI Cdr."
- 12) Gordon's official NASA business suit portrait made after his astronaut selection. SIGNED and INSCRIBED: "RICHARD GORDON, Group 3 Astronaut, 1963."

\$1,000 - 1,500

75

SATURN WIND TUNNEL ROCKET ENGINE NOZZLE.

ORIGINAL WORKING SCALE MODEL USED AT NASA LEWIS RESEARCH CENTER.

Various metals, 8 1/2 inches tall, [1964], being a rocket engine nozzle, with evidence of having been fired.

Provenance:

NASA scientist Oral Mehmed.

An original engine nozzle used for wind tunnel tests in the early to mid 1960s at NASA's Lewis Research Center (now known as Glenn Research Center). It was part of a liquid-fueled five-engine working scale model used in the development of the Saturn family of rockets.

\$2,000 - 3,000



73



74



75



76

76

SATURN V APOLLO LAUNCH VEHICLE MODEL.

Hand-made model, approximately 1/200 scale, made from a solid aluminum one-piece fuselage with attached wooden parts, on wooden base with a plaque engraved *Saturn V*, circa mid-1960s. 21-1/4 x 2-1/2 inches diameter, excluding base. Escape tower damaged, otherwise complete, with minor paint losses.

Provenance:

Manufactured by a major aerospace model shop.

Designed for the Apollo moon missions, Saturn V was the most powerful rocket ever built at the time. It carried all of the Apollo missions beyond Earth's orbit, and later carried Skylab into orbit. It was planned as a launch vehicle for the shuttle program, but the shuttles ended up using Solid Rocket Boosters (SRBs) instead.

\$3,000 - 5,000



77

77

APOLLO CSM DOCKING MODEL.

Handmade wooden model of an Apollo CSM with open nose cone (fixed in open position) for demonstration of docking operations, 9-1/2 inches high by 5-1/2 inches diameter, on circular wooden base, in custom wooden box, with steel rod and corresponding recess in the open nose of the CSM to connect to a separate model.

Provenance:

Manufactured by a major aerospace model shop.

\$2,000 - 3,000

78

APOLLO OPERATOR MANUALS.

COLLECTION OF ORIGINAL NORTH AMERICAN AVIATION APOLLO MANUALS.

Group of 16 manuals, 10 1/2 x 8 inches through 5 3/4 x 8 3/4 inches, Downey, California, 1962-1967.

Titles include:

1. *Block II CSM Propulsion Subsystem.*
2. *Electrical Power Subsystem Block II CSM.*
3. *Structures and Mechanical Subsystems.*
4. *Environmental Control System Block II.*
5. *Guidance and Navigation Subsystem.*
6. *Stabilization & Control Subsystem.*
7. *Electrical Power System Study Guide.*
8. *Stabilization & Control Subsystem Block II.*
9. *CSM/LM Docking and Crew Transfer Block II Handout.*
10. *Environmental Control System Study Guide.*
11. *Electrical Power Subsystem.*
- 12 & 13. *Sequential Systems (SECS, EDS, LES, ELS).*
14. *Telecommunications System.*
15. *Apollo Spacecraft Familiarization.*
16. *Preliminary Apollo Ground Handling System Study.*

WITH: 3 North American Rockwell Space Shuttle Program manuals, 1970-1979:

1. *Space Shuttle Program, Executive Summary, Part 2.*
2. *Proposal to Accomplish Phase B Space Shuttle Program.*
3. *Space Shuttle System Capabilities.*

An amazing collection of firsthand material for both the Apollo spacecraft and the Space Shuttle.

\$1,500 - 2,500



78

79

ED WHITE'S APOLLO 1 SPACECRAFT MODEL.

Apollo 1 model, c.1967, 21 x 4.5 inches on a 7.5 x 1 inch wooden base. Model divides into four parts comprising the Launch Escape System, Command Module, Service Module and LEM Adapter. LES body made of white painted wood with red painted tower jettison and pitch control motors and silver painted propulsion engines supported by white metal scaffolding labelled "UNITED STATES" on either side. White plastic Command Module with four metallic grooves for attaching Launch Escape System, blue painted "windows," red painted Control Pitch Engines and Reaction Control Engines with two American flags, "United States" labels on either side. Wood Wooden Service Module painted white, with concave top and metallic nub for holding Command Module in place, four gray and red painted Service Module Reaction Control System thrusters positioned around body, and one gray and red painted Service Propulsion Engine nozzle at the base. White plastic LEM Adapter screwed into wooden base. Base with black plastic overlay lettered in yellow with "APOLLO SPACECRAFT CONFIGURATION 1/40 SCALE MODEL" around the circumference of the model.

Provenance:

The Ed White Estate Collection.

The first of the Apollo missions was marked by tragedy as a cabin fire during a launch rehearsal test on January 27, 1967 resulted in the deaths of all three participating astronauts including Senior Pilot Edward White, the first American to make a walk in space on the Gemini IV flight of June, 1965. The Apollo disaster came despite the expressed concerns by its crew about the amount of flammable material (mainly nylon netting and Velcro) in the Command Module.

\$1,500 - 2,500

80

APOLLO 1: ORBITAL CHART SIGNED BY 9 APOLLO ASTRONAUTS.

Apollo Mission Chart (AMC) 204.
Aeronautical Chart and Information Center, [December 1966]. 336 x 1,1138 mm.
SIGNED AND INSCRIBED by Buzz Aldrin, Ed Mitchell, Alan Bean, Al Worden, Charlie Duke, Gene Cernan, Jim Lovell, Walt Cunningham and Fred Haise. The inscriptions indicate their gratitude for the Apollo 1 mission and the astronauts who lost their lives: "They made the ultimate sacrifice for space exploration" (Bean); "Gus - Ed - Roger - made the dream possible" (Cernan). Rolled.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition from the Defense Mapping Agency. This chart plots the orbits of the planned Apollo 1 mission (preliminarily titled AS-204). The mission was intended to be the first manned test flight of the Apollo CSM, but the tragic launch pad fire meant that this test did not take place until 18 months later on Apollo 7.

\$2,500 - 3,500



79



80



81

APOLLO PROGRAM NAME STAMPS.

ORIGINAL ILC, DOVER BETA CLOTH RUBBER STAMPS FOR APOLLO PROGRAM ASTRONAUTS

Group of 140 rubber stamps, various sizes, used to stamp astronaut names on Beta cloth tags, [1965-1972], many with "Franklin Rubber Stamp Co. / Wilmington, Del" on handle.

WITH: 8 ILC Industries "SCRAP" tickets, most dated August 14, 1972 and with description of scrap contents and part/assembly number.

AND WITH: Collection of material from ILC Industries and related companies including annual reports and press brochures, etc.

ILC Dover was formed as a division of the International Latex Corporation focused on government and industrial projects. They were awarded the prime contract by NASA for the Apollo Lunar

Space Suit due to the approach they took to creating flexible joints in the air filled suits. The suits that they made were customized for each of the program's astronauts and each piece of the suit was labeled for that astronaut. Many parts of the suit were labeled with a Beta cloth tag stamped with the astronaut's name. The present collection includes 140 of the original rubber stamps used to create the name tags. The stamps include most of the astronauts who flew Apollo missions including the entire Apollo 11 crew of NEIL ARMSTRONG, BUZZ ALDRIN and MICHAEL COLLINS, each of the Moonwalkers, as well as several who never made it on an Apollo mission. Multiple examples for many of the astronauts including all capitals, upper/lowercase and size variants. A complete list available upon request.

\$8,000 - 12,000



82

82

NASA HAND-MADE CIRCULAR SLIDE RULE.

Used in the "Trench" at Mission Control during Apollo 7. Plastic sheet, card stock, central metal brad hub, 280 mm diameter, hand-made at NASA Mission Control to calculate trajectories. Contained in sleeve made of heavy card stock and stapled around three edges.

WITH: *All Purpose Space Rule*. Houston: NASA Flight Control Division, 1967. Folding whiteprint chart tipped in at back, showing graphs of trajectory calculation. Bound with staples, on 5-hole punched paper.

Provenance:

Granville E. Paules III, who served as Launch Phase Guidance Officer on A7.

In a 2006 interview for NASA Johnson Space Center Oral History Project, Granville E. Paules III explained the "Space Rule":
"We didn't have all the computer programs for calculating backup procedures if the computer failed, for getting the crew in the right attitude to reenter safely. They were in a circular orbit, so there shouldn't have been any problem.

When you're going around, and if they had to go to alternate sites around the world because of a problem, you need the computer to calculate the correct attitude of the spacecraft so it comes in right and it does all the right yaw maneuvers. You needed to align the platform, the inertial platform on board, correctly so that it would handle the spacecraft, and it wouldn't get in a position where it was what we call gimbal lock. This inertial platform can only go so many degrees in different axes, and so you align it to get the most reasonable midpoint of where any extreme would occur, rolling and rocking around, pitching.

You always had to align the spacecraft platform, depending on where you were going to come in, and we didn't have a computer program to do all that, so in terms of these procedures we all developed, I had a great big wheel. It was made out of cardboard with plastic and stuff on it that had all the key stars that they might see. I put them in the right star field orientation, and then if they were to see a certain star and they could identify it, we could tell them what angles they needed to put into the spacecraft backup system to reenter properly. That was all a handmade thing. It didn't depend on any computers."

\$3,000 - 5,000

83

APOLLO 8: CREW SIGNED ORBIT CHART.

Apollo Earth Orbit Chart (AEO), Sheet 3 of 3. Printed paper chart, 343 x 1,050 mm, *SIGNED* by two of the crew members, and the mission CAPCOM: "Michael Collins, *Apollo 8 CAPCOM, December 21, 1968,*" "First Trip to the Moon, Frank Borman, *Apollo 8 CDR,*" and "On our way to a Lunar Christmas, James Lovell, *Apollo 8 CMP.*" Contained in a mylar and paper protective sleeve, rolled.

Collins was originally assigned to the Apollo 8 crew as Command Module Pilot, but he had to undergo surgery for a herniated disc. Jim Lovell, who was more experienced than any of the three assigned crew members, was assigned to replace Collins as CMP. William Anders, the Lunar Module Pilot, is the only member of the primary crew whose signature does not appear here.

\$800 - 1,200



83



84

84
**GENERAL ELECTRIC / WESTERN UNION
 TRANSATEL CONTRACTOR'S MODEL.**

APOLLO-ERA SATELLITE TECHNOLOGY
 Original Contractor's Model, glass, wood, plastic and metal on wooden base, 140 x 120 x 120 mm, featuring a model satellite on a rotating wooden base inside a cutaway dome surrounded by miniature ops buildings, dome featuring GE and two Western Union International, Inc. decals; base marked "Transatel / General Electric"; storage facilities with GE device. Together with yellow printed "Apollo 11" folder containing 7 "Apollo 11 Splashdown" news releases, two sheets of contact proofs with images of the Transatel in action, and related ephemera.

Transatel (Transportable Satellite Telecommunications Terminal) was first used during Apollo 7, but the system, which allowed live color footage to be broadcast throughout the world, came into its own during Apollo 11 & 13 when hundreds of millions of viewers tuned in around the world. We can find no examples of this model appearing at auction. Doubtlessly, very few were ever produced.

\$1,000 - 2,000



85

85
1963 GRUMMAN PROTOTYPE LEM.

Plastic and metal, 155 h x 200 w x 200 d, with two "United States" decals on the body, later custom base featuring Grumman logo and NASA meatball.

Grumman received the contract for the Lunar Excursion Module in 1962 and with the promise of a quick turnaround. This early proposal model (circa 1963), informally referred to as the "bug," shows the second proposed design with 5 legs, a round hatch, no ladder on the leg and large windows. Due to weight concerns, the design changed considerably along the way with the windows shrinking to small, triangular portals, the removal of seats, and a reduction of exterior protection to a bare minimum. We have not seen another example of a LEM model this early at auction.

\$5,000 - 7,000

86

**HAND CRAFTED LUNAR MODULE
CONTRACTOR'S DEVELOPMENT
MODEL.**

Grumman LEM contractor's model in wood and aluminum, on glass base, 8-1/4 x 8-1/40 x 7-3/4 inches. Base marked with Grumman and NASA logos, and titled "Lunar Excursion Module."

Provenance:

Manufactured by a major aerospace model shop.

As Grumman Aerospace rapidly developed the Lunar Module concept, the design iterations moved toward a reduction in unnecessary mass. This rare development model shows a state of development circa 1965 or 1966, discarding the streamlined features of earlier designs that were not needed in the vacuum of space. It approaches the final design, but is still somewhat bulky compared to the final version. No other example of this version of the Lunar Module concept is known to have been offered at auction.

\$6,000 - 8,000

87

**GRUMMAN APOLLO LUNAR MODULE
CONTRACTOR'S MODEL.**

Painted metal and plastic model on circular base, base with Grumman logo at left and NASA logo at right. Height 6 inches (152 mm); diameter of base 10 inches (254 mm). In original box, never removed.

APOLLO 11 VERSION OF THE GRUMMAN MODEL. Grumman built and tested the LM at its Bethpage NY facility. These models were given out as mementos by the company, and sold to employees in the company store. This model does not bear the Armstrong's quote on the base, dating it to before the landing of Apollo 11.

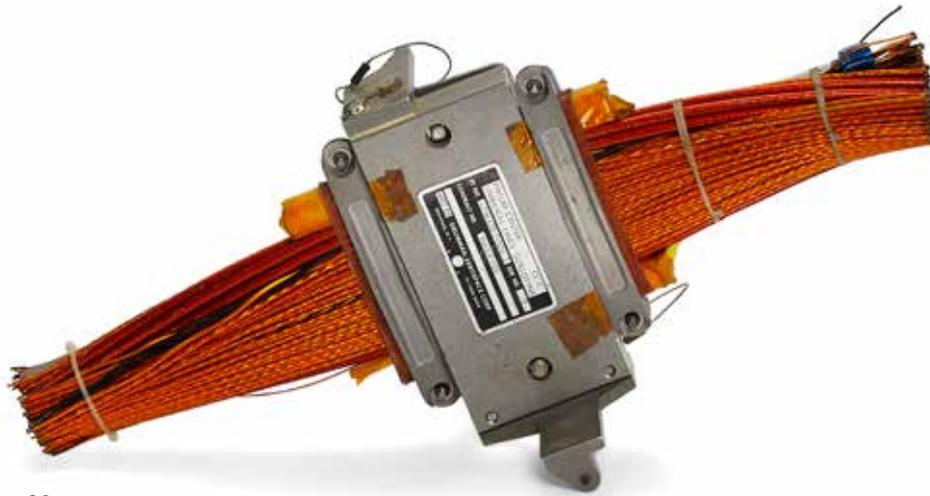
\$2,500 - 3,500



86



87



88



89

88

APOLLO LUNAR MODULE: CUTTING THE UMBILICAL CORD.

Umbilical Lines Guillotine Fixture, Center. Test sample guillotine fixture, in machined alloy, with lengths of wire attached at either end, mid-1960s, lacking internal blade and explosive charges, 19 x 7-1/2 x 5-1/8 inches. Bearing Grumman Aerospace Corp identification plate, listing it as part number LDW420-11006-3. Some tape residue.

Provenance:

A major aerospace model shop.

The Ascent Stage and Descent Stage of the Lunar Module had continuous wiring between them, which had to be severed in order for the Ascent Stage to take off. This was achieved by firing explosive charges that would drive metal blades through the bundles of wires, using a guillotine apparatus such as this. This test specimen comes complete with the cover of the blade housing, part number LDW420-11354-1, but not the blade that would have been inside it.

\$3,000 - 5,000

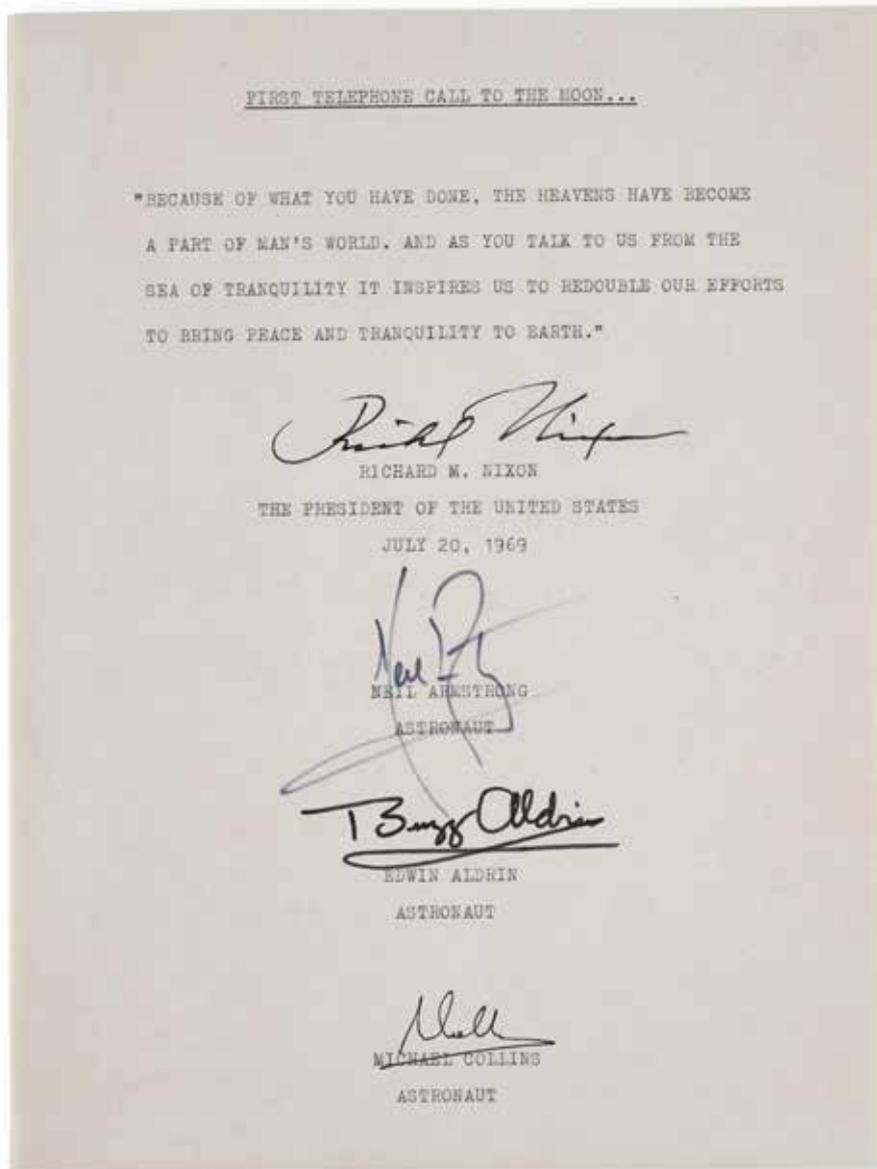
89

GRUMMAN APOLLO LUNAR MODULE INFORMATION.

A group of printed material related to the Apollo Lunar Module, including prints of conceptual drawings showing deployment of the LEM on the Lunar surface, the use of the ALSEP, docking procedures, and proposed Lunar surface exploration vehicles, along with detailed multi-page cutaway diagrams of the LEM on mylar cells, photos of full-size LEM and CSM mock-ups, and other Apollo related ephemera. All circa 1969-1970.

\$600 - 800

"Because of what you have done, the heavens have become a part of man's world."



90

90

FIRST TELEPHONE CALL TO THE MOON.

PRESIDENT NIXON AND THE APOLLO CREW SIGN A PARTIAL TRANSCRIPT OF THE HISTORIC FIRST CALL TO THE MOON. Document Signed ("Richard Nixon," "Neil Armstrong," "Buzz Aldrin," and "M Collins") 1 p, dated July 20, 1969, but later, titled "First Telephone Call to the Moon...", being a partial transcript of the Nixon's words to Armstrong and Aldrin.

In full: *"Because of what you have done, the heavens have become a part of Man's World. And as you talk to us from the Sea of Tranquility it inspires us to redouble our efforts to bring peace and tranquility to Earth."*

Nixon considered his call to Armstrong and Aldrin on July 20th, 1969, the day they had landed on the Moon, "the most historic phone call ever made from the White House." At his desk in the Oval Office, his telephone routed to Houston and onward through CapCom, at that time Bruce McCandless II, to outer space, he thanked the astronauts on behalf of the American people and expressed the pride held by all the people of the world. Just a few days later, the President would thank the astronauts in person while they were quarantined aboard the USS Hornet after their return to Earth.

\$20,000 - 30,000

AGS ACTIVATION
& SELF-TEST

ACT-41

CSM MANEUVERS TO LDMK TRACK ATT

98:40

RATE GYRO CHECK

1. GYRO TEST - POS RT (RPY RATE +5°/sec)
GYRO TEST - NEG RT (YPR RATE -5°/sec)
2. RATE SCALE - 5°/SEC
Repeat Tests

Flown To The Moon on Apollo XI
JULY 1969

Buzz Aldrin

98:40

AGS ACTIVATION & SELF-TEST

1. AGS STATUS - STBY (Master Alarm,
AGS Warning Lt-ON)

CB(16) STAB/CONT: AEA-CLOSE
CB(11) AC BUS B: AGS - CLOSE (AGS WARN. LT-OFF)
AGS STATUS - OPERATE (AGS WARN LT- ON)
02/H20 QTY MON - C/W RESET
(AGS Warning Lt-OFF)
2. *6666 (OPR ERR Lt-ON)
3. *000+88888
4. *123-45679
5. *412+0 REINITIATE TEST
*412R +1 SELF TEST SATISFACTORY
+3 LOGIC TEST FAILURE
+4 MEMORY TEST FAILURE
+7 LOGIC AND MEMORY TEST FAILURE

L

Basic Date May 26, 1969
Changed July 412 VK

91

PREPARING FOR THE FIRST DESCENT TO THE LUNAR SURFACE.

APOLLO 11 LUNAR MODULE CHECKLIST. AGS Activation and Self-Test checklist on card stock, printed on recto and verso, 137 x 202 mm, with title on extending tab, listing "CSM Maneuvers to LDMK Track ATT," in two columns on recto that include "Rate Gyro Check" and "AGS Activation and Self-Test," steps 1 through 5, continuing on verso with steps 5, 6 and finally step 7 "CDR and LMP Doff Helmet and Gloves." SIGNED AND INSCRIBED in margin below first column: "Flown to the Moon on Apollo XI, July 1969, Buzz Aldrin." Framed, with 2-sided glazing.

BUZZ ALDRIN'S FLOWN APOLLO 11 LUNAR MODULE CHECKLIST. The AGS was the Abort Guidance System, a backup navigation system to the PGNS or Primary Guidance and Navigation System. Although there was no occasion to use the AGS for navigation, it was cross-checked with the PGNS prior to landing the Lunar Module to ensure that the two systems were in agreement. This was mainly a step to give the astronauts confidence in their systems.

\$12,000 - 18,000

92

SIGNED BY THE ENTIRE APOLLO 11 CREW.

Apollo 11 Beta cloth crew emblem, 89 mm (3-1/2 inches) in diameter, printed on white Beta cloth. The emblem features a bald eagle carrying an olive branch above the lunar surface with the earth in the background. Overall 229 x 229 mm (9 x 9 inches). Matted and framed.

Provenance:

Sold in these rooms, March 25, 2013.

SIGNED by NEIL ARMSTRONG, MICHAEL COLLINS, and BUZZ ALDRIN.

\$8,000 - 10,000



93

APOLLO 11 CREW-SIGNED PHOTO.

INSCRIBED BY NEIL ARMSTRONG TO APOLLO 11 MSC FLIGHT DIRECTOR Photograph Signed on mount ("Neil Armstrong," "Michael Collins" & "Buzz Aldrin") and inscribed, 7 x 9 1/4 inches, [1969], mounted to board, depicting the 3 Apollo 11 crewmembers in spacesuits before a backdrop of the Moon.

92

Neil Armstrong expresses his appreciation to longtime Manned Spacecraft Center at Houston (MSC) Flight Director Clifford Charlesworth, who served from 1962-1970. He served as the Flight Director for Gemini 11 and Gemini 12, one of the Flight Directors for Apollo 8, as well as the first moon landing, Apollo 11. He finished with Apollo 12 before moving to the Earth observation satellite program and later the Space Shuttle program. Armstrong here personally inscribes the photo: "To Cliff Charlesworth — with our sincere appreciation for your friendship and your professional performance as our 'flight.'" He also adds "Apollo 11 —" after Aldrin's signature.

\$7,000 - 9,000



93



94

94
ALDRIN'S APOLLO 11 MOON LANDING CREW SIGNED POSTAL COVER.

LIFE INSURANCE FOR THE CREW MEMBERS FAMILIES.
 Apollo 11 Life Insurance Postal Cover measuring approximately 4 x 6 inches with a cachet featuring two astronauts exploring the lunar surface. Postmarked at Houston, Texas on the date of the Apollo 11 lunar landing and moon walk, July 20, 1969. Numbered on the verso by Aldrin with his identifier number "BA31." The envelope is displayed between paragraphs of a Typed Signed Letter by BUZZ ALDRIN using his personal stationery.

Provenance:
 Originally from the personal collection of Buzz Aldrin.

The postal envelope was SIGNED by NEIL ARMSTRONG, MICHAEL COLLINS, and BUZZ ALDRIN prior to their Apollo 11 lunar landing mission.

With BUZZ ALDRIN'S Signed Provenance Letter in which he describes the history of this cover: *"This Manned Spacecraft Center Stamp Club postal cover with a lunar exploration scene and a small Apollo 11 emblem is one of the 'insurance covers' signed by the Apollo 11 crew prior to our launch in July 1969. Since we were unable to obtain adequate life insurance due to the high risk nature of being an astronaut, we signed this group of covers and evenly distributed them to our families for safe keeping while we performed our mission. If an unfortunate event prevented our safe return, the covers would have provided a limited financial means of support to our families.*

The cover displayed above has been in my private collection since 1969 and has the identifier of BA31 written on the reverse side. It was signed by the Apollo 11 crew—Neil Armstrong, Michael Collins, and myself prior to our launch. The cover was postmarked on the lunar landing day of Apollo 11 at Houston, Texas, on July 20, 1969. Just a few hours after landing, Neil Armstrong and I became the first humans to walk on another celestial body—the Moon."

\$6,000 - 9,000



95

95
APOLLO 11 GOODWILL DISC.

MESSAGES FROM PLANET EARTH. A circular silicon disc, 1 1/2 inches diameter but with one flattened edge, wafer-thin, one side coated in blueish-purple coating, etched lettering "From Planet Earth ... July 1969" visible to the naked eye, and an array of microscopic etching, the reverse gray-colored, manufactured by the Semi-Conductor Division of Sprague Electric Company of North Adams, Massachusetts.

Along with the American flag and the "We came in peace for all mankind" plaque, Neil Armstrong and Buzz Aldrin left a silicon disc on the lunar surface. That disc was manufactured by Sprague, an established NASA contractor with more than 50,000 components in Apollo spacecraft. Commissioned by NASA's Electronics Research Center, it carried messages from 73 world leaders, gathered in a frantic rush by NASA and the State Department in the weeks before the launch date.

The messages were photographed, reduced 200 times, and etched onto the surface of the disc just like integrated circuits. The example carried on Apollo 11 and now on the Moon's surface, like its sister in the Smithsonian, was encased in a protective aluminum holder, with eleven sides symbolizing Apollo 11.

It is unclear how many of the discs were produced, but the consignor, a descendant of one of the company's employees states that 76 were produced: one for each country who contributed a message, one carried aboard the Apollo 11 and two extra for the family. It's likely that only a handful exist now in private hands. A prototype disc without all the messages was sold in these rooms on April 26, 2012 (lot 1202). The present example is identical to that on the Moon and is from the final run that also included a message from the Pope.

The discs have been the subject of the book by Tahir Rahman, *We Came in Peace: The Untold Story of the Apollo 11 Silicon Disc* (2007).

\$5,000 - 7,000

FLOWN APOLLO 11 COMMAND MODULE THERMAL LAYER SEGMENT.

IN SPACE FOR SOME 195 HOURS AND MADE 30 ORBITS OF THE MOON.

FLOWN foil segment, being approximately 5/8 by one half inch, mounted on a Typed Note Signed by Buzz Aldrin. Included is an 8 by 10 inch official NASA photolithograph of the Apollo 11 astronauts in their space suits. Both displayed on an approximately 14 x 12 inch blue mat board.

The photolithograph is SIGNED and INSCRIBED: "BUZZ ALDRIN, Apollo XI LMP."

Provenance:

Originally from the collection of Buzz Aldrin.

BUZZ ALDRIN'S signed provenance note reads: "The segment placed here was removed from Command Module Columbia after the first manned lunar landing mission during July 16 to 24, 1969. This flown segment is from my personal collection." Part of Command Module Columbia's thermal protection system was a highly reflective layer that covered the entire outer surface. This skin segment traveled some 500,000 miles during the Apollo 11 flight and was exposed to the vacuum of space for over 195 hours. The thirty lunar orbits lasted almost 60 hours.

\$2,000 - 3,000

ARMSTRONG USED LAUNCH FLIGHT ABORT TRAINING SHEET, TLI CONFIGURATION.

FOR AN EMERGENCY RETURN OF COLUMBIA BACK TO EARTH. Apollo 11 Launch Operations Checklist, page 4-11 and 4-12, a single sheet printed recto and verso. NASA/MSC, April 15, 1969, revised June 27, 1969. 8 x 5 1/2 inches. Red tinted for quick reference during an emergency. With a Typed Letter Signed by BUZZ ALDRIN using his personal stationery and copy of the checklist front cover.

Provenance:

Originally from the personal collection of Buzz Aldrin.

INSCRIBED and SIGNED: "Used in training for Apollo XI, BUZZ ALDRIN" on page 4-11.

BUZZ ALDRIN'S signed provenance letter reads in part: "Accompanying this letter is a sheet numbered 4-11 and 4-12 from the CSM 107 (Apollo 11) Launch Operations Checklist, SKB32100080-306. It was part of the complete manual that was used in the Command Module simulator ... The sheet is from Section 4 titled: Abort Procedures.

The entire checklist, including this page, was used by all three Apollo 11 crew members: Neil Armstrong, Michael Collins, and myself. We referred to this section almost every time we performed a launch simulation because the simulator team would often put us in a situation that required us to execute an abort. Side 4-11 has the steps for an abort if an emergency arose during TransLunar Injection, and we had to return to earth immediately.

We would separate from our S-IVB, the third stage of the Saturn rocket, and get into a retro attitude. Side 4-12 has blank spaces to log the real-time spacecraft attitude coordinates. Needless to say, this would not have been an enjoyable condition, having started our burn to send us to the Moon. Neil would make the command decision onboard for this abort.... I have written on page 4-111: "Used in training for Apollo XI" and signed that page."

\$1,200 - 1,800

ARMSTRONG USED LAUNCH CHECK LIST TRAINING SHEET, LIFTOFF CONFIGURATION.

PREPARING COLUMBIA FOR A FLIGHT TO THE MOON.

Apollo 11 Launch Operations Checklist, page 1-9 and 1-10, a single sheet printed recto and verso. NASA/MSC, April 15, 1969, revised June 16, 1969. 8 x 5 1/2 inches. With a Typed Letter Signed by BUZZ ALDRIN using his personal stationery and copy of the checklist front cover.

Provenance:

Originally from the personal collection of Buzz Aldrin.

INSCRIBED and SIGNED: "Used in training for Apollo XI, BUZZ ALDRIN" on page 1-9.

BUZZ ALDRIN'S signed provenance letter reads in part: "Accompanying this letter is a page numbered 1-9 and 1-10 from the CSM 107 (Apollo 11) Launch Operations Checklist, SKB32100080-306. It was part of the complete manual that was used in the Command Module simulator ... The sheet is from Section 1 titled: Liftoff Configuration.

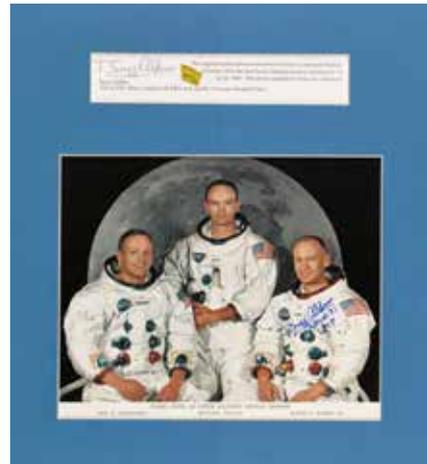
The entire checklist, including this page, was used by all three Apollo 11 crew members: Neil Armstrong, Michael Collins, and myself. We referred to this section every time we performed a launch simulation. All of the control panel switches, dials, and knobs had to be set to the liftoff settings defined in this section.

Side 1-9 has all the settings required for Panels 16, 100, 101, and 122... Panels 100 and 122 were in the Lower Equipment Bay, while Panel 101 was in the Aft Compartment... Side 1-10 has panel 162, 163, 180, 225, 226, and 250 settings. These 6 panels were distributed throughout the Lower Equipment Bay and Aft Compartment...

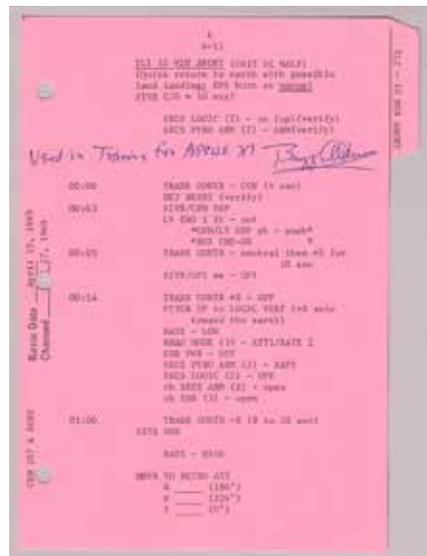
It was important to rehearse the flow of this activity in the simulator. It was an excellent learning device and the checklist was an important tool in insure our correct performance. This training was a key step which enabled our flight to make the first lunar landing on July 20, 1969.

I kept this checklist after our mission as a reminder of all the training that took place back in 1969. I have written on page 1-9: "Used in training for Apollo XI" and signed that page."

\$1,000 - 1,500



96



97



98



99

99

APOLLO 11 MISSION-USED COMPUTER DATA.

COMPUTER PRINTOUTS SHOWING PITCH AND YAW READINGS. A group of graph paper telemetry printouts showing pitch and yaw readings for the Apollo 11 launch. Most on continuous graph paper by Clevite Corporation, some marked in ink "Apollo 11 Ascent," one marked on the external surface "Apollo 11—Pitch, Landphase, Mission U2t2." 5 sheets are labeled "506 Launch Velocity Dispersions," stapled together. All rolled, some wear and foxing to paper edges.

Provenance:

Granville E. Paules III, who served as Lead Launch Guidance Officer on A11, and used these printouts during the mission.

\$1,000 - 2,000

100

APOLLO 11 CBS NEWS LAUNCH BROADCAST SCRIPT.

Original script, 6 pp, recto, CBS News, July 16, 1969, 8:00 AM to 1:00 PM, entitled "Man on the Moon: The Epic Journey of Apollo 11," with felt-tip pen notes on 3 of the pages.

An original copy of the "rundown sheet" for CBS News' coverage of the Apollo 11 launch, which featured anchor Walter Cronkite and astronaut Wally Schirra as co-host. CBS News was the most-watched network coverage of the mission and many still remember Cronkite's reporting of the moon landing. Joel Banow, who was Director of all CBS News live coverage of Mercury through Apollo points out that this copy was used to prompt the use of "film banks" of recorded material that would have been interspersed with the live coverage. He also stated that the handwriting could possibly have been that of Robert Wussler, CBS News Producer in New York.

\$1,000 - 1,500

101

NEIL ARMSTRONG SIGNED AND INSCRIBED APOLLO 11 PHOTOGRAPH.

"THROUGH A GLASS STARKLY." Color photograph, 270 x 350 mm laid down to larger board, photograph of Buzz Aldrin on the moon, taken by Neil Armstrong, signed and inscribed at the lower mount: "Through a glass starkly" - 1969 - / To Connie - With the Admiration of the Photographer - Neil Armstrong / Apollo 11."

Handsome example of an early large format Armstrong signed photo with a play on 1 Corinthians 13:12.

\$2,000 - 3,000



100



101

102

APOLLO 11.

Lunar Module Eagle. Color photograph taken by Michael Collins from the Apollo 11 Command Module, 16 x 20 inches, unmounted. Includes certificate of authenticity from Astronaut Central. Excellent condition.

SINGED BY MICHAEL COLLINS at the upper right: "Michael Collins — Apollo XI CMP." Depicting the Lunar Module *Eagle* above the lunar surface, with the Earth visible in the background.

\$1,000 - 2,000



103

APOLLO 11 AT TRANQUILITY BASE, SIGNED.

Color photograph, 8 x 10 inches, with wide white margin at left, *SIGNED AND INSCRIBED* in blue pen in Armstrong's hand: "To Gran — With thanks for all your contributions to this picture! Best of luck, Neil Armstrong, Tranquility Base," and in black pen "Buzz Aldrin." Additionally marked at the top left "Apollo 11, Jul '69 16133200.78z."

Provenance:

Granville E. Paules III, who served as Lead Launch Guidance Officer on A11.

\$2,000 - 3,000

104

ALDRIN AT TRANQUILITY BASE.

Large color photographic print, 30 x 24 inches (760 x 609 mm), depicting Aldrin standing on the Lunar surface, *SIGNED AND INSCRIBED* by Aldrin: "Tranquility Base — July 20, 1969" to the left of his image, and "Buzz Aldrin — Apollo XI" to the right. With certificate of authenticity by Astronaut Central. Rolled.

\$2,000 - 3,000



102



103

104

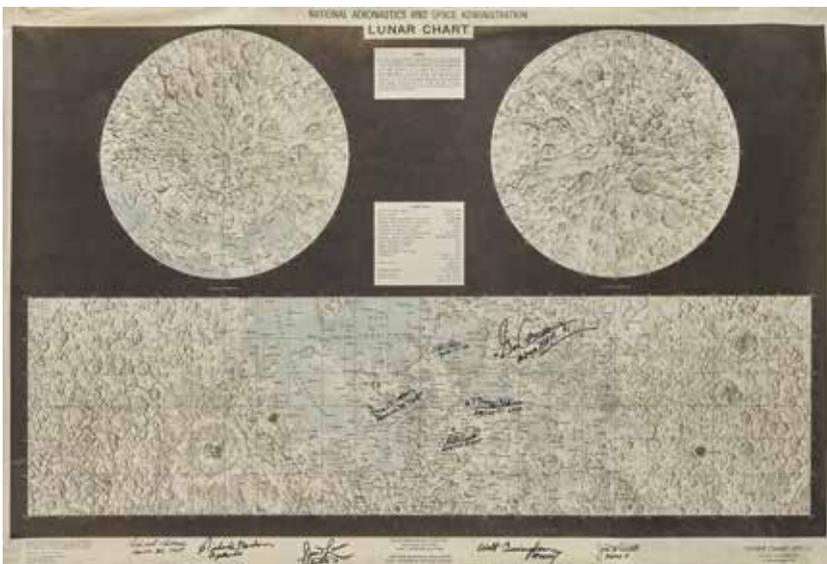


105

105

APOLLO 11: MCCANDLESS AS CAPCOM.

Color photograph, 16 x 20 inches (407 x 508 mm; image size 306 x 404 mm), SIGNED AND INSCRIBED by Bruce McCandless with Armstrong's "one small step" quote at top, and McCandless's commentary at the bottom: "Sitting in Mission Control in Houston, I was the only contact on earth for Neil Armstrong, Buzz Aldrin, and Mike Collins when I took over as CAPCOM at 105:47:50 Mission Elapsed Time. 'Eagle' had landed...." Together with 3 smaller (8 x 10 inch) photographs showing McCandless with this photograph, and signing the photograph.



106

\$1,000 - 2,000

106

APOLLO 11 LUNAR MAP SIGNED BY 9 ASTRONAUTS.

Printed black and white map of Lunar Surface, 655 x 968 mm, SIGNED by Alan Bean, Dave Scott, Buzz Aldrin, Charlie Duke, Michael Collins, Walt Cunningham, Richard Gordon, James Lovell, Jim McDivitt, and Gene Cernan. Wear and creasing to corners, rolled.

\$6,000 - 8,000

107

APOLLO 11: ALDRIN SIGNED TELESCOPE STAR CHART.

LM-LO Star Chart (A), Launch July 16. Circular printed chart, SIGNED BY BUZZ ALDRIN on verso: Star Chart LM Telescope Used During Training - Buzz Aldrin, on two layers of thin printed plastic stock, 216 mm diameter.



107

The top layer has 6 overlapping circular areas, marked 1-L, 2-F, 3-R, 4-RR, 5-CL, and 6-LR. A small circular velcro patch on verso allows it to be attached to a viewer to simulate the selectable 6 field-of-view positions of the Lunar Module telescope.

\$3,000 - 5,000

108

APOLLO 11 SEA OF TRANQUILLITY LANDING SITE CHART.

THE ACTUAL LANDING AREA MARKED BY BUZZ ALDRIN.

Julius Caesar, Lunar Shaded Relief – LSR 60. Defense Mapping Agency for NASA. Having a detailed legend with a gridded full sphere lunar near side map locator image. First edition, September 1978. 22 x 29 inches, scale 1:1,000,000.

BOLDLY INSCRIBED and SIGNED:

“Tranquility Base, July 20 – 21, 1969. BUZZ ALDRIN.” He has marked the Apollo 11 landing site with an “X.”

The sixtieth chart of the LSR series featuring approximately half of the Mare Tranquillitatis have the Apollo 11 landing area. West and North of the landing site has an increasing number of craters and rugged highland areas. Wrinkled-type ridges surround point of Neil Armstrong’s historic landing.



108

\$2,000 - 3,000

109

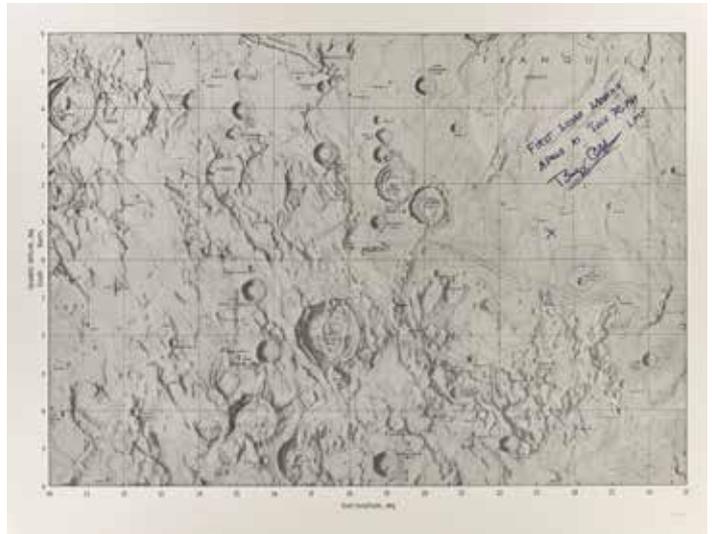
APOLLO 11 FIRST LUNAR LANDING SITE CHART.

EXTENSIVE INSCRIPTION BY BUZZ ALDRIN.

A chart of the Mare Tranquillitatis and surrounding areas, captioned “MSC – 6132 – 69.” Lunar east longitude is marked in degrees from 10 to 27 along the bottom and latitude is marked from 0 to 6 degrees north and south. Issued for internal NASA Manned Spacecraft Center (MSC) use prior to and during the Apollo 11 mission. 17 x 22 inches.

BOLDLY INSCRIBED and SIGNED: *“First Lunar Landing, Apollo XI, July 20, 1969, BUZZ ALDRIN, LMP.”* He has marked the Apollo 11 landing site with a large “X.”

Numerous craters are identified including the Sabine series which Armstrong and Aldrin observed during the lunar landing and later during ascent back to lunar orbit after their some 22 hour stay at Tranquility Base. Contour lines are marked every 600 feet in elevation.



109

\$2,000 - 3,000

110

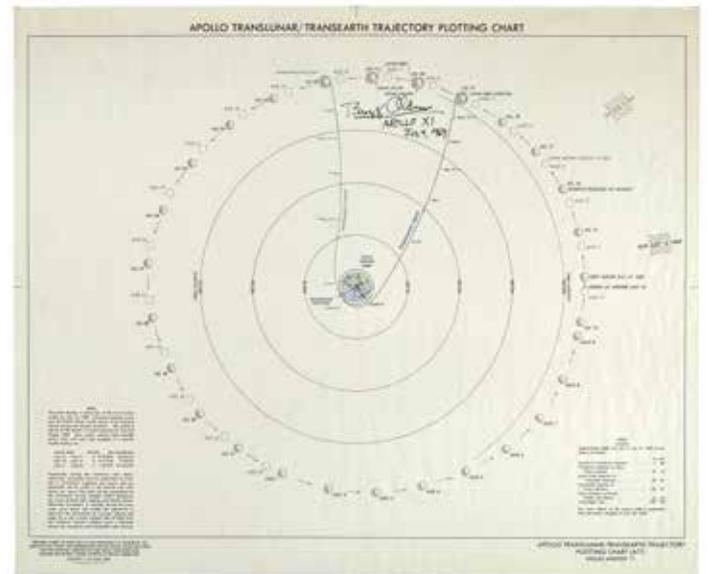
APOLLO 11: ALDRIN SIGNED TRAJECTORY CHART.

Apollo Translunar/Transearth Trajectory Plotting Chart. Aeronautical Chart and Information Center, United States Air Force, for NASA, June 23, 1969. 508 x 605 mm. SIGNED *“Buzz Aldrin – Apollo XI, July 1969.”*

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, prepared by the Defense Mapping Agency.



110

\$1,500 - 2,500



111

111

APOLLO 11 ORBIT CHARTS SIGNED BY ALDRIN.

Apollo Earth Orbit Chart (AEO). Aeronautical Chart and Information Center, U.S. Air Force, 19 June 1969. 3 sheets, each approximately 375 x 1,135 mm. First edition. Each SIGNED "Buzz Aldrin — Apollo XI — 16 July, 1969." Rolled.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, from the Defense Mapping Agency.

\$1,200 - 1,800

112

APOLLO 11 LUNAR DESCENT CHARTS, SIGNED BY ALDRIN.

LM Descent Monitoring Chart. Two charts on one sheet, *Sheet 3 A* and *Sheet 3 B*. 691 x 1,055 mm overall. Both signed individually: "Buzz Aldrin — Apollo XI — 20-21 July 1969."

WITH: A photostatic reproduction of *The Orientor*, journal of the U.S. Air Force Chart and Information Center, July 3, 1969, 4 pp on 2 sheet, with stories about preparations for the Apollo 11 flight.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, prepared by the Defense Mapping Agency. As LEM pilot, Aldrin contributed to the preparation of these charts.

\$1,000 - 2,000

113

A ROAD MAP FOR THE FIRST LUNAR LANDING.

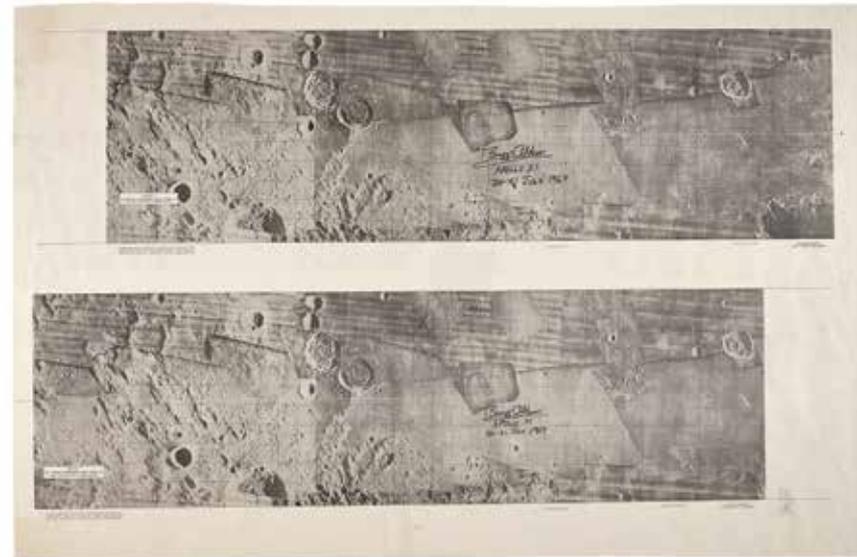
ALDRIN SIGNED APOLLO 11 TRAJECTORY CHART.

Apollo Translunar / Transearth Trajectory Plotting Chart (ATT), Apollo Mission 11. June 23, 1969, 24 x 20 inches. Includes a printed flight time summary based on the July 16 launch and detailed notes section. Located at opposite lower corners of the chart.

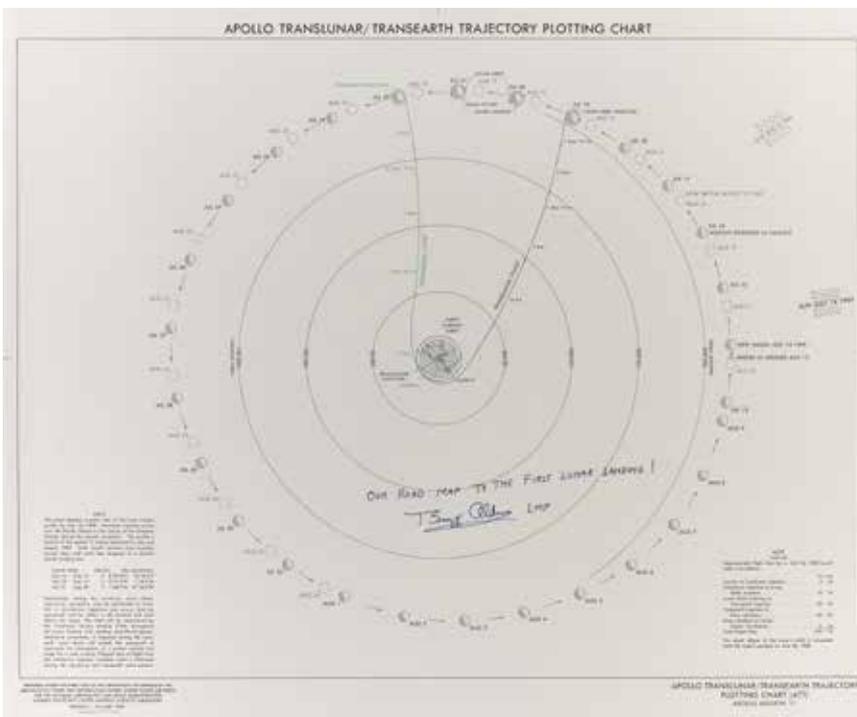
BOLDLY INSCRIBED and SIGNED: "Our Road Map to the First Lunar Landing! BUZZ ALDRIN, Apollo LMP."

The chart is centered on a north polar view of the Earth and displays the July/August 1969 orbital path of the moon around the Earth. The Apollo 11 flight profile is plotted and events such as earth launch, translunar injection, lunar and earth coast phases, lunar orbit insertion, lunar landing - liftoff, and transearth injection are included.

\$2,000 - 3,000



112



113

114

APOLLO 11: COLLINS SIGNED DESCENT MONITORING CHART.

Edition 1, LM Descent Monitoring Chart, Sheet 3A. Printed paper chart, 317 x 902 mm, SIGNED "Michael Collins Apollo XI, July 20, 1969," rolled.

This chart shows the trajectory to what was originally designated "Landing Site 2," very close to the actual location of tranquility base. It identifies the craters Sabine B, Sabine D and Sabine E, which have since been renamed Aldrin, Collins and Armstrong in honor of the Apollo 11 crew.



114

\$800 - 1,200

115

APOLLO 11 CELEBRATION.

Apollo 11 Chicago Ticker Tape Parade welcome sign, printed board, 22 x 28 1/4 inches, [Chicago, August 13, 1969], depicting the Apollo logo of an eagle landing on the moon with "WELCOME TO CHICAGO" bordering.

WITH: Lunar Module pennant, felt, approximately 26 inches long, 8 1/4 inches at its widest point, [Grumann, 1969], depicting the Lunar Module with "LM" printed beside it. AND WITH: 8 x 10 inch photograph of two workers hanging a sign identical to the above.

Only a few days after being released from quarantine, Armstrong, Aldrin and Collins were given a hero's welcome of ticker-tape parades in New York and Chicago with an estimated 6 million attendees. The above sign is a relic of that Chicago celebration.



115

\$1,500 - 2,000

116

APOLLO 11: MOONWALK DOCUMENTARY.

Moonwalk One. United States Information Service, 1970.

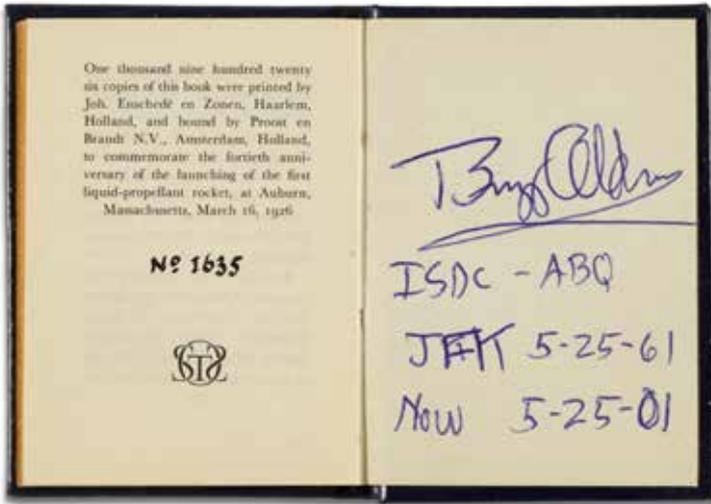
2 parts, on 2 15-inch reels of 16 mm color print sound film, contained in brown metal canisters with red and white labels of the Film Division, National Library (of Australia), Canberra.

NASA approached documentary filmmakers Francis Thompson and Alexander Hammid with the idea of producing a film about the Apollo program, culminating with the first Moon landing. They obtained funding from MGM, but the studio later pulled their support. As the Apollo 11 launch approached, NASA contacted Thompson again with a less ambitious budget proposal, and he in turn brought on editor Theo Kamecke, who assembled footage in various formats from multiple sources to put the film together. *Moonwalk One* was critically acclaimed, winning a special award at the Cannes Film Festival, but was not a commercial success. It was re-released in a "director's cut" on DVD in 2009.



116

\$2,000 - 3,000



117

117

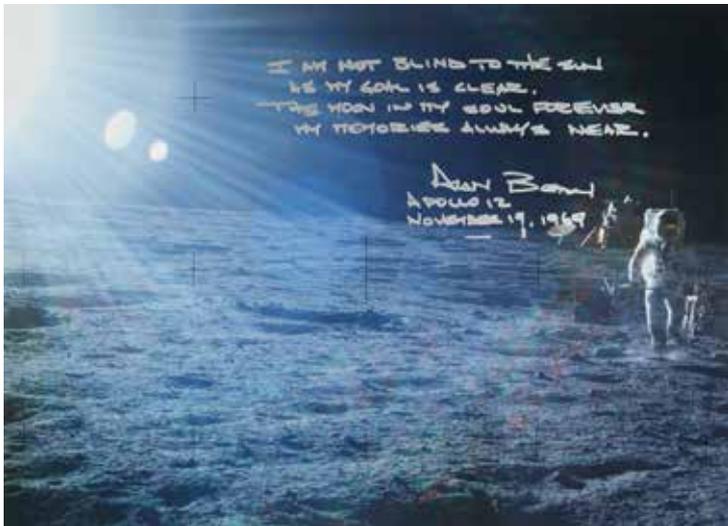
BUZZ ALDRIN SIGNED ROBERT GODDARD MINIATURE BOOK.

The Autobiography of Robert Hutchings Goddard, Father of the Space Age. Early Years to 1927. Worcester, MA: Achille J. St. Onge, 1966. Miniature book, 2 7/8 x 2 1/8 inches, original blue leather stamped in gilt, all edges gilt. #1635 of 1926 copies (the year of Goddard's first liquid-propellant rocket launch).

Provenance:

Esther Goddard, with her inscription and provenance statement on included card.

THIS COPY SIGNED & INSCRIBED BY BUZZ ALDRIN at the International Space Development Conference (ISDC) on May 25, 2001, of which Aldrin notes was 40 years after JFK's congratulatory speech to Alan Shepard as the first American in Space aboard the Mercury Spacecraft.



118

Mrs. Goddard's provenance card and inscription note the connection of this book with Aldrin as he had brought a copy of with him to the Moon during Apollo 11, later depositing it in the Clark University Goddard Collection. Interestingly, Aldrin's father had studied with Robert Goddard and helped, along with Charles Lindbergh, to gain Guggenheim Foundation support.

\$3,000 - 5,000

118

ALAN BEAN IN THE OCEAN OF STORMS.

Color photograph, 16 x 22 inches (406 x 559 mm), SIGNED AND INSCRIBED BY ALAN BEAN WITH A KIPLING QUOTATION: "I am not blind to the sun as my goal is clear, the moon in my soul forever, my memories always near. — Alan Bean, Apollo 12, November 19, 1969." Bean is at the far right of the image, with the lunar surface stretching far into the distance.

\$800 - 1,200



119

119

APOLLO 12: DICK GORDON SIGNED "EARTHRISE."

Color photograph, 16 x 20 inches (407 x 508 mm), SIGNED AND INSCRIBED by Gordon: "While Pete Conrad and Alan Bean [were] landing on the Ocean of Storms, I piloted our Command Module 'Yankee Clipper' around the moon. I mapped and photographed Fra Mauro and Descartes landing sites for Apollo 14 and Apollo 16 — Richard Gordon &mdash Apollo 12 Command Module Pilot — November 19-20 1969." Together with 2 smaller photographs (8 x 10 inches) showing Gordon inscribing and signing this photograph.

\$1,000 - 1,500

120

APOLLO-ERA DOCKING PROBE BAG.

c.1970. Beta cloth bag, with brass zipper marked "barjo," interior Velcro pocket, approximately 36 x 28 inches, label text on either side heavily worn, but appears to read "docking probe a3 launch offload," two handles approximately 7-1/16 x 1 inches.

Specifically designed for NASA after the tragic Apollo 1 disaster, Beta cloth is a fire-resistant fabric composed of Teflon coated silica. Various designs of these bags were used to store equipment or protect samples against possible contamination.

\$1,000 - 1,500

121 [□]

APOLLO COMMAND MODULE WINDOW.

Glass window panel, by Teledyne Optics, c.1970, in wooden shipping crate, approximately 342 x 323 mm x 17 mm (0.7 inches) thick, unused. The box bears a mailing label from Teledyne Optics to North American Aviation Space and Information Systems Division (the primary building contractor for the Apollo Command Service Modules), as well as inked part number and a faded information label also bearing the part number: V16-321383-5"A."

This example is evidently a side window for the CSM, which had two side windows, two triangular docking windows on either side of the hatch, and a single window in the middle of the hatch. The specifications for this window called for 0.7-inch thick amorphous fused silicon glass, with an anti-reflective coating on the external surface.

\$5,000 - 7,000



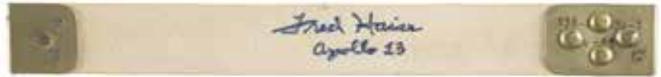
120



121



122



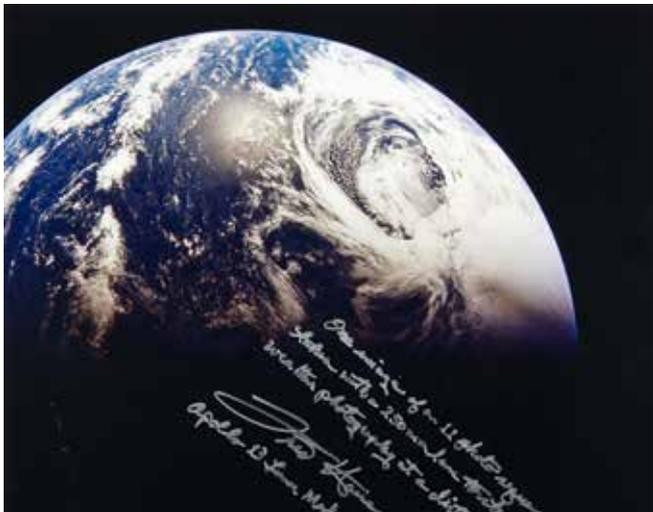
122

APOLLO 13 EQUIPMENT STORAGE STRAP.

Flown A8 (Aft 8) Command Module equipment locker stowage strap. Made of heavy weave synthetics, 1 x 7-1/2 inches (26 x 235 mm) with metal end-plate connectors. One is a dual snap plate with a partly readable ID of "V36-7... 24 - 3... 4 - 68...." and a circular inspection stamp with "ANM N67." The opposite end has a peg type connector with a partly readable ID of "V36-7800 ... - 5... 3... - 69... C" and a circular inspection stamp with "... NM 426." The woven material is stamped "V36 730024 51." SIGNED by FRED HAISE and INSCRIBED: "Apollo 13."

The A8 locker was mounted on the aft bulkhead of the Command Module below the crew couches. This locker had four storage areas with outer doors labels which included: Return 70mm Camera, 70 mm Film Mag, Lunar Surf Camera, 16 mm Mag, Transfer Bag, Decontam Bag, Rock Samp Container, Headset, Exerciser, and Pilot Preference Kit. A photocopy of a Rockwell Space Division Temporary Parts Removal Tag is included, as well as a color photograph of an Apollo CSM storage locker and a location diagram of the CSM.

\$2,000 - 3,000



123

APOLLO 13: FRED HAISE SIGNED PHOTOS.

Two color photographs, both SIGNED AND INSCRIBED by Fred Haise, comprising:

1. "Earth," 278 x 299 mm, depicting Earth from lunar orbit, inscribed "One image of an 11 photo sequence taken with a 250 mm lens to study weather photography at a distance! — Fred haise — Apollo 13 Lunar Module Pilot."
2. "Water Landing," 277 x 356 mm, depicting the splashdown of Apollo 13, inscribed "A great day — splashdown of Apollo 13 in South Pacific Ocean! — Fred Haise — Apollo 13 LMP — April 17, 1970."

\$800 - 1,200

124

APOLLO 13: LOVELL SIGNED TELESCOPE STAR CHART.

Apollo 13 LM LO-2 HR, 11 April 70 Launch.

Circular printed chart, SIGNED BY JIM LOVELL on verso: LM Telescope Star Chart Used During Training - James Lovell, on two layers of thin printed plastic stock, 216 mm diameter, dated February 15, 1970.

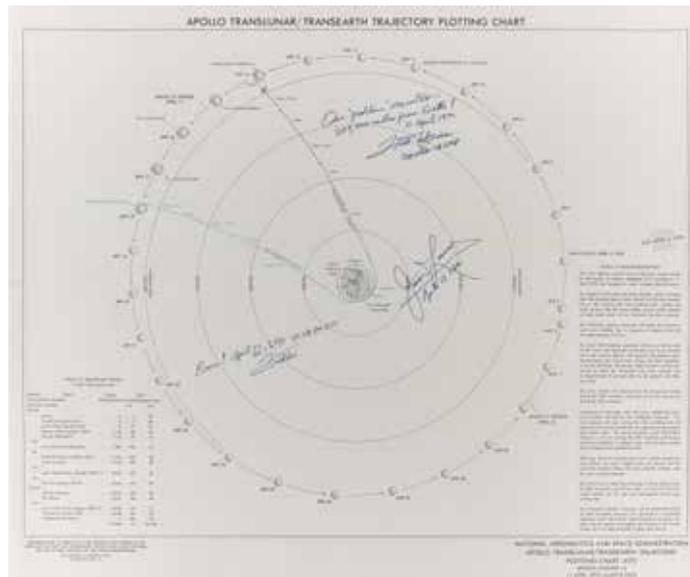
The top layer has 6 overlapping circular areas, marked 1-L, 2-F, 3-R, 4-RR, 5-CL, and 6-LR. A small circular velcro patch on verso allows it to be attached to a viewer to simulate the selectable 6 field-of-view positions of the Lunar Module telescope.

\$2,000 - 3,000

123



124



125



126

125

ON APRIL 13, 1970: BOOM! NOT YOUR TYPICAL DAY IN SPACE.

ANNOTATED BY CREW MEMBERS THAT SURVIVED THE DEEP SPACE EMERGENCY AND CLEARLY ILLUSTRATES HOW FAR THE FLIGHT EXPLOSION WAS FROM EARTH.

Apollo Translunar / Transearth Trajectory Plotting Chart (ATT), Apollo Mission 13. Diagram in color with extensive descriptions in nine paragraphs and astronaut signatures. First Edition, March 16, 1970. 24 x 20 inches.

BOLDLY SIGNED and **INSCRIBED**: "JAMES LOVELL, Apollo 13 CDR."

INSCRIBED and **SIGNED**: "Our 'problem' occurred 200,000 miles from earth! 13 April 1970, FRED HAISE, Apollo 13 LMP." He has marked an "X" where the explosion occurred along the flight path and added: "Boom! April 13, 1970, 10:08 pm EST, Fredo" with the number 13 underlined to emphasize the coincidental numbering of the flight and explosion date.

A vivid illustration of how far away from Earth the Apollo 13 spacecraft was when the Service Module's oxygen tank exploded. The complex steps of a lunar mission are illustrated from a north polar view. Earth launch, lunar and earth coast phases, lunar orbit insertion, lunar landing - liftoff, the transearth injection, and earth return are all dimensionally illustrated. Significant Apollo 13 flight events with times are listed in the lower left corner and an eight paragraph mission description is located along the right side.

\$2,000 - 3,000

126

FLOWN APOLLO XIII CREW EMBLEM WITH SIGNED MISSION PHOTOGRAPH.

PART OF THE LIFE AND DEATH STRUGGLE IN DEEP SPACE.

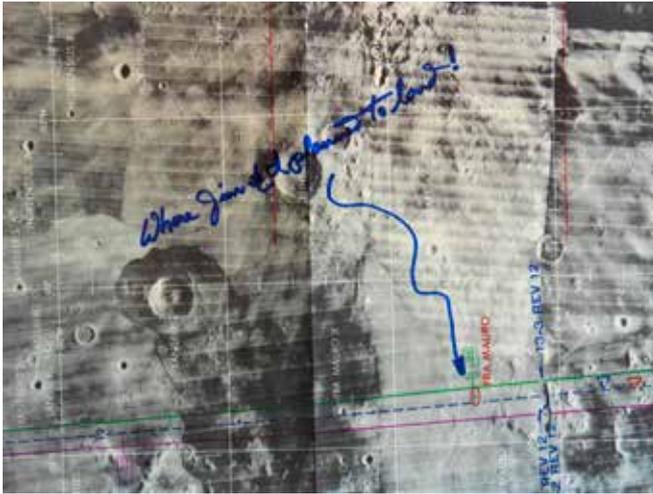
FLOWN Apollo XIII cloth emblem, 4 inches in diameter. The design has three horses, symbolic of the three astronauts, traveling from the Earth to the Moon. A multi-rayed Sun is in the background, with the Latin motto "Ex Luna, Scientia" (*From the Moon, Knowledge*). The emblem is mounted on a Typed Letter Signed by JAMES LOVELL. All displayed on and removable from an 11 by 20 inch light gray mat board which includes a 7 by 7 inch black and white photograph of the damaged Service Module. The explosion blew off large outer panels revealing the extensive internal damage caused by the oxygen tank failure.

Provenance:

From the collection of Apollo 13 Commander James Lovell. With JAMES LOVELL'S signed provenance letter which reads: "The attached patch was flown aboard the Apollo 13 spacecraft on its flight around the moon April 11-17, 1970. This patch was designed by the artist Luman Winter after a mural he painted for the St. Regis Hotel in New York City."

The damaged Service Module (SM) photograph is **INSCRIBED** and **SIGNED**: "BOOM! The Apollo 13 SM, FRED HAISE, Apollo 13 LMP." The photograph was made just after the Service Module was jettisoned from the Command Module, and prior to the crew's re-entry into the Earth's atmosphere. During the four day flight around the Moon, Lovell, Haise and Jack Swigert used their Lunar Module as a "life boat" to survive.

\$4,000 - 6,000



127

127

LUNAR ORBIT PHOTO TASKS FOR APOLLO 13.

THE COMPLETE CHART A SERIES CONSISTING OF FOUR MAPS. Lunar Orbital Science Flight Chart, Chart A, 1 of 4, 2 of 4, 3 of 4, and 4 of 4, Apollo Mission 13, REV 1 through 18. First Edition, February 2, 1970. Aeronautical Chart and Information Center, USAF for NASA. All 21½ x 43 inches. Issued for the April 11, 1970 launch date with spacecraft part number SKB 32100082-327. Scale 1:2,500,000 with nautical mile distance markers found in two locations. Each with three vertical folds making 4 equal sized segments.

ALL charts SIGNED and/or INSCRIBED by FRED HAISE. Charts 1, 2, and 4 have Haise's additional inscription of: "Apollo 13 LMP." Chart 3 has Haise's inscription of: "Where Jim and I planned to land!" with a long arrow drawn to the red landing ellipse.

These four charts cover the entire lunar surface (near and far sides, no longitude gaps) from 20 degrees North and South latitude. Continuous tracks for orbits 1 through 18 are plotted in three colors at the near centers of each chart. Two have legends defining camera lens to use and symbols for the landing site, subsolar point, subearth point, photo targets, and visual observation limits.

\$1,000 - 1,500

128

APOLLO 14 CHARTS SIGNED BY ED MITCHELL.

A group of 3 Apollo 14 charts, all draft copies of the first editions, comprising:

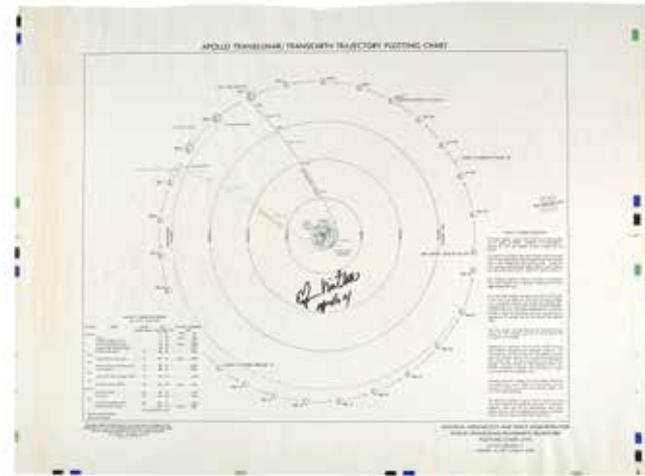
1. *Apollo Earth Orbit Chart.* Aeronautical Chart and Information Center, U.S. Air Force, for NASA, November 6, 1970. 370 x 1,150 mm. SIGNED "Ed Mitchell — Apollo 14."
2. *Apollo Translunar/Transearth Trajectory Plotting Chart.* December 16, 1970. 566 x 764 mm. SIGNED "Ed Mitchell — Apollo 14."
3. *Lunar Orbital Science Contingency Flight Chart.* December 4 1970. In two sheets. Sheet 1 of 2, 725 x 1,120 mm, and Sheet 2 of 2, 720 x 1,135 mm. Both SIGNED "Ed Mitchell — Apollo 14 LMP." All with handling creases, especially at upper and lower edges.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, prepared by the Defense Mapping Agency.

\$1,200 - 1,800



128

129

APOLLO 14: MITCHELL SIGNED LUNAR MODULE TELESCOPE STAR CHART.

LM PRE-LIFTOFF, JAN. 31 1971, LAUNCH.

Circular printed chart, SIGNED BY EDGAR MITCHELL on verso: *LM Telescope Star Chart Used During Training - Edgar Mitchell, Apollo 14 LMP*, on two layers of thin printed plastic stock, 216 mm diameter, dated September 22, 1970.

The top layer has 6 overlapping areas of 3 concentric circles, marked 1-L, 2-F, 3-R, 4-RR, 5-CL, and 6-LR. A small circular velcro patch on verso allows it to be attached to a viewer to simulate the selectable 6 field-of-view positions of the Lunar Module telescope.

\$1,000 - 2,000



129

130

APOLLO MOON SAMPLE BAG.

Cup-shaped plastic bag with number "1" on side, aluminum rim with extension tab, [1971].

Moon sample bags were used during EVA to collect lunar rock samples. This cup-shaped design, which was used for Apollo 15-17, was an improved version of the earlier flat bag. The present design could be attached to an extension handle and unlike the earlier design, was numbered. The present example, numbered "1" and identical to those used during the Apollo missions, may have been used in training. Please see National Air and Space Museum ID#2009-7172.

\$1,000 - 2,000



130

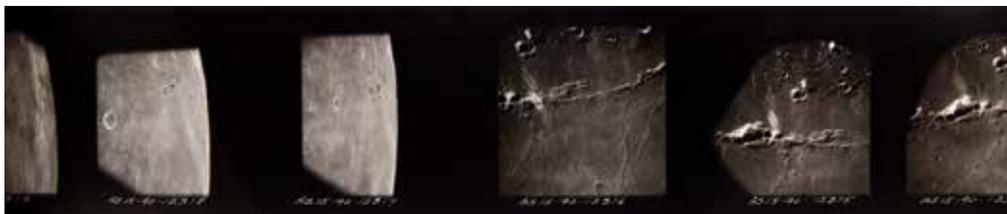
131

APOLLO 15: 70 MM FILM ROLLS.

3 rolls of 4th generation 70 mm black and white positive Hasselblad film, without edge perforations. Contained in black tin canisters with white paper labels stamped "Apollo 15" and marked as MAG OO, MAG PP, and MAG WW.

These Hasselblad rolls captured images of the lunar surface and lunar orbit. Magazine OO recorded the lunar surface from orbit, the moonwalk, lunar rover, and planting of the flag. Magazine PP recorded some images of the lunar rover, use of a lunar sample rake, and many more images of the surface from orbit and around the landing site. Magazine WW exclusively contained images of the lunar surface.

\$2,000 - 3,000



131

132

APOLLO 15 SIGNED NAVIGATIONAL CHARTS.

Three Apollo 15 charts signed by Worden and Scott, all first drafts of the first editions, including:

1. *Apollo Lunar Orbit Chart*. Aeronautical Chart and Information Center, U.S. Air Force, for NASA, June 1, 1971. 323 x 1,045 mm. First edition. SIGNED AND INSCRIBED "Al Worden — In orbit — Apollo 15 CMP" and "Dave Scott — Hadley Apennino — Apollo 15 CDR."
 2. *Apollo Flight Chart*. June 1, 1971. 300 x 870 mm. First edition. SIGNED "Dave Scott — Apollo 15 CDR" and "Al Worden — Apollo 15 CMP."
 3. *Apollo Earth orbit Chart*. November 6, 1970. 335 x 1.166 mm. First edition. SIGNED AND INSCRIBED "Al Worden — Track Around the World — Apollo 15 CMP" and "Dave Scott — On the Way!! — Apollo 15 CDR."
- Rolled.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

\$1,000 - 2,000



132

133

APOLLO 15 SIGNED TRAJECTORY CHART.

Apollo Translunar/Transearth Trajectory Plotting Chart. Aeronautical Chart and Information Center, United States Air Force for NASA, March 25, 1971. 457 x 696 mm. First edition. SIGNED by Scott and Worden: "Dave Scott — Apollo 15 CDR" and "Al Worden — Apollo 15 CMP." Rolled.

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

Draft copy of the first edition, prepared by the Defense Mapping Agency.

\$800 - 1,200

134

APOLLO 15: KRANZ SIGNED LUNAR MODULE SIGNAL FLOW DATA SHEET.

Ascent Engine Signal Flow. Printed folding diagram, 267 x 940 mm, with hand written and ruled notations in colored pencil and blue marker, SIGNED at the upper right: *From my console files in Houston Mission Control during the flight of Apollo XV — Gene Kranz.* 5 punch holes at left margin, all torn through.

Gene Kranz, the Flight Director for all of the Apollo moon landing missions, is perhaps best known for being the leader of the "White Team" that was on duty when Apollo 13 experienced an explosion on board the spacecraft. He and his team were awarded the Presidential Medal of Freedom collectively for their efforts to ensure the safe return of the Apollo 13 crew. He also earned NASA's Exceptional Service Medal, Distinguished Service Medal, and Outstanding Leadership Medals. His signature white vest and Apollo 13 pin are on display at the National Air and Space Museum. He retired from NASA in 1994.

\$800 - 1,200

135

APOLLO 16 SIGNED CHARTS.

4 Apollo 16 orbit charts, all draft copies of the first editions, including:
1. *Apollo Earth Orbit Chart.* Published February 15, 1972. 340 x 1,053 mm. SIGNED AND INSCRIBED: "Leaving Earth Orbit Over Australia — Charlie Duke &mdash Apollo 16."
2. *Apollo Flight Chart.* Published February 23, 1972. 278 x 708 mm. SIGNED AND INSCRIBED: "TLI Over Australia — Charlie Duke &mdash Apollo 16."
3. *Apollo Lunar Orbit Chart.* Published February 16, 1972. 305 x 1,034 mm. SIGNED AND INSCRIBED: "Our Landing Site at Descartes — Charlie Duke &mdash Apollo 16."
4. *CSM/LM Orbit Monitor Chart, Sheet 4 of 4.* February 4, 1972. 545 x 1,160 mm, ends roughly trimmed. SIGNED AND INSCRIBED: "Our Landing Site — Charlie Duke - Apollo 16," with an arrow and "X" to mark the site. All rolled.

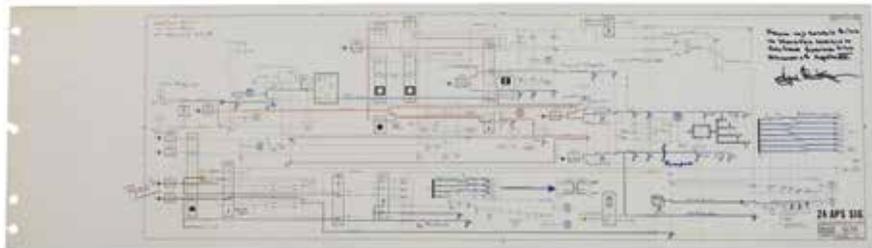
Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

\$1,200 - 1,800



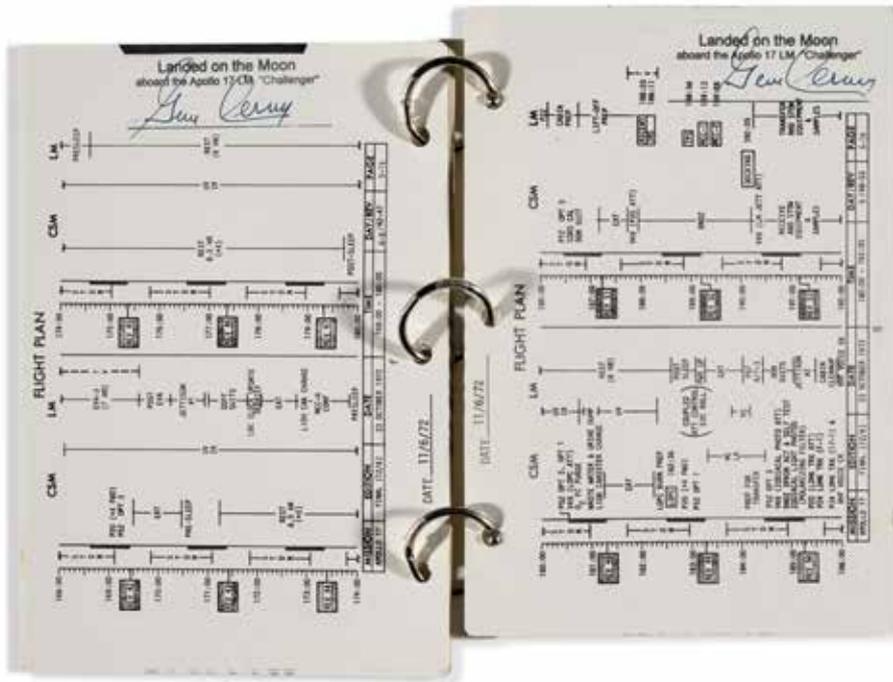
133



134



135



136

APOLLO 17 FLIGHT PLAN FLOWN TO THE LUNAR SURFACE.

Flown Apollo 17 Flight Plan, pp a-g, on 4 sheets printed recto and verso. NASA/MSC, November 6, 1972, 5 1/2 x 8 inches. Signed on each of the 8 pages by Gene Cernan including on the provenance label on the final, blank page. With a Typed Letter Signed by GENE CERNAN.

Provenance:

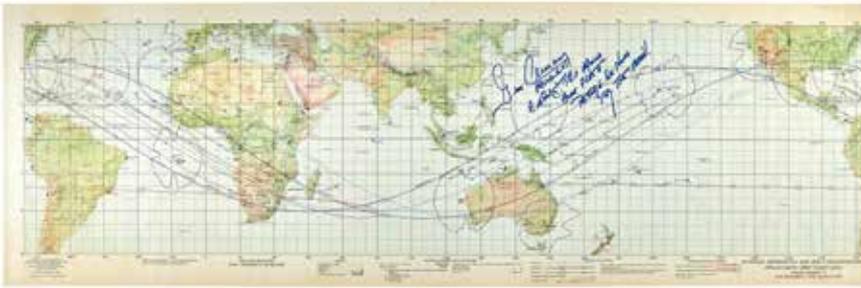
The Eugene A. Cernan Space Collection, signed label on blank 8th page and with provenance stamp beside it; Each of the 7 printed pages stamped "Landed on the Moon aboard the Apollo 17 LM 'Challenger,'" and signed by Cernan below.

A detailed plan of the three days on the lunar surface in the Taurus-Littrow valley — the final time man would walk on the Moon. The plan lists in minute detail the tasks to be completed by both of the Lunar Module crew members, Gene Cernan and Harrison Schmitt, but also,

in a parallel column, those of Command Service Module pilot Ronald Evans. The LM instructions begin with "activation and checkout" (the disengagement from the CSM) details the three EVAs (Extra Vehicular Activity), and concludes with the docking of the LM with the CSM, transfer of equipment and samples and preparation to jettison the LM.

Accompanied by GENE CERNAN's signed provenance letter which reads in part: "During our flight, we carried a seven-page flight plan with us to the lunar surface aboard our lunar module. The flight plan is especially historic because it records both mankind's final 'Apollo' landing on the Moon, and also mankind's final moonwalk, which I accomplished on page "f" of this checklist ("EVA-3")! The flight plan spent over three days on the lunar surface housed within our Lunar Module 'Challenger,' during which time it resided within the Moon's one-sixth gravitational field and vacuum of deep space!"

\$20,000 - 30,000



137

137

APOLLO 17: CERNAN SIGNED CHARTS.

Earth and moon orbital charts for Apollo 17, all draft copies of the first editions, comprising:

1. *Apollo Earth Orbit Chart (AEO), Apollo Mission 17 For December 6, 1972 Launch Date.* Defense Mapping Agency Aerospace Center, for NASA, October 16, 1972. 307 x 1,035 mm. First edition. SIGNED AND INSCRIBED: "Gene Cernan, Apollo XVII — A short trip around 'Home Plate' before we head for the MOON!"
2. *Apollo Lunar Orbit Chart (ALO), Apollo Mission 17, Trajectory for CSM Revolutions 1, 47, 49 and 75.* Defense Mapping Agency Aerospace Center, for NASA, October 13, 1972. 345 x 1,053 mm. First edition. SIGNED AND INSCRIBED: "Gene Cernan, Apollo XVII — The 'Last Man on the Moon' but only until next time."

Provenance:

Employee of the Defense Mapping Agency in St. Louis, by direct descent to current owner.

\$1,000 - 2,000

138

LAST MAN ON THE MOON: CERNAN SALUTES THE LAST STARS AND STRIPES.

Large color photograph, 11 x 14 inches.

Boldly INSCRIBED and SIGNED: "Last Man on the Moon, GENE CERNAN, Apollo XVII CDR, Dec 1972."

Apollo 17 Commander Gene Cernan holds and salutes the last United States flag placed on the lunar surface.

\$1,000 - 1,500



138

139

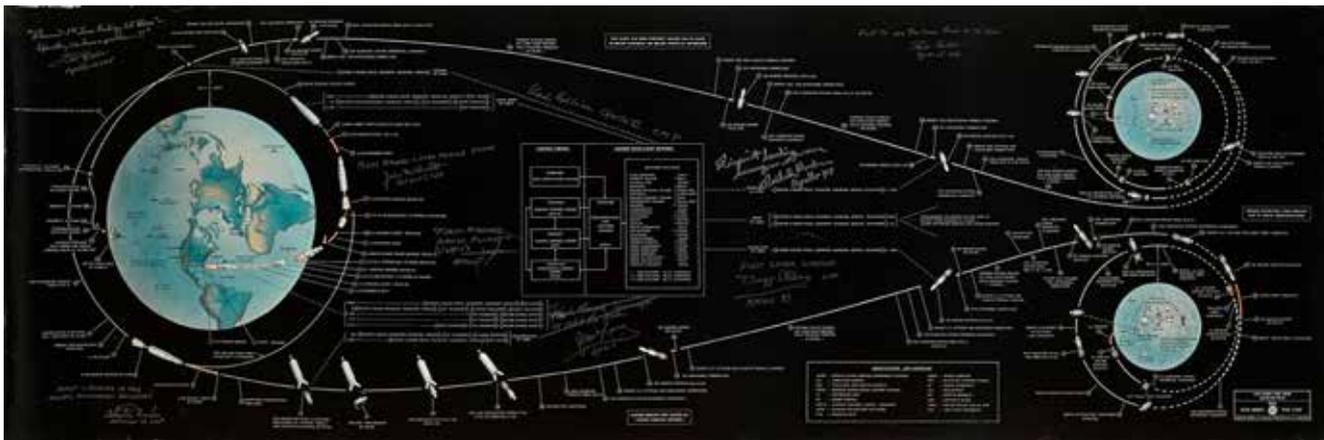
APOLLO-SOYUZ TEST PROJECT MODEL.

1:50 scale model of the American Apollo CSM and Russian Soyuz, wood and painted metal, 17 inches (432 mm) long assembled. The two vehicles are connected by a black Docking Module (DM) which provided a functional docking port for each spacecraft. The entire model is mounted above a 7-inch oval wood base, with plaque on the top reading: "Apollo-Soyuz Test Project, Scale 1/50, Space Division, Rockwell International," with Rockwell logo.

\$1,500 - 2,000



139



142

140

STAFFORD'S FLOWN ASTP BETA CLOTH EMBLEM.

Apollo/Soyuz beta cloth emblem, 140 x 145 mm, the printed emblem itself 88 mm diameter, *SIGNED AND INSCRIBED* by Stafford: "FLOWN ON ASTP — July 15-24, 1975 — Tom Stafford." Fine condition.

Stafford, along with Vance Brand and Deke Slayton, flew the historic Apollo/Soyuz Test Project mission in 1975, the first joint U.S./Soviet space mission.

\$1,000 - 1,500

141

TOM STAFFORD'S ASTP FLOWN BETA CLOTH.

FLOWN Apollo Soyuz crew emblem, 3-1/2 inches in diameter. Printed on a white Beta cloth section 5-1/2 inches square. Displayed with descriptive text on TOM STAFFORD business stationery.

The Beta emblem is *SIGNED* by TOM STAFFORD, D.K. SLATON, VANCE BRAND, ALEXEI LEONOV, and VALERY KUBASOV. Additionally *INSCRIBED* and *SIGNED*: "Flown on ASTP, 15-24 July 1975, Tom" [Stafford].

The letter text reads: "This Apollo-Soyuz Beta cloth emblem was carried in space on the historic Apollo-Soyuz Test Project during July 15 - 24, 1975. It was placed in my personal preference kit (PPK) on board the Apollo Command Module. Beta cloth was used for a fire protection layer in our Apollo spacesuits. This emblem has been signed by all Apollo and Soyuz crew members. I have written 'Flown on ASTP, 15 - 24 July 75, Tom' on the emblem."

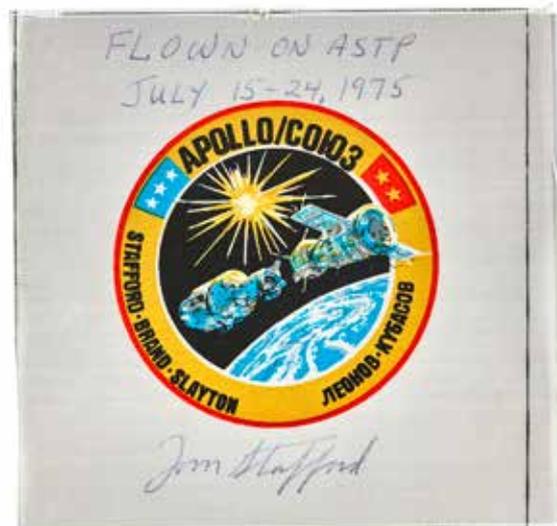
\$1,000 - 1,500

142

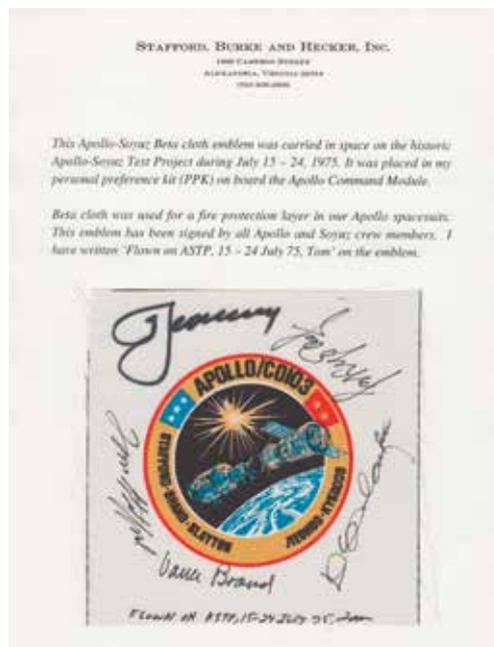
APOLLO LUNAR LANDING MISSION PROFILE CHART SIGNED BY 9 ASTRONAUTS.

Apollo Manned Lunar Landing GOSS-Mission Profile. Published by NASA Office of Manned Space Flight, 540 x 1,450 mm, *SIGNED* by Apollo astronauts Fred Haise, Charlie Duke, Jim McDivitt, Walt Cunningham, Michael Collins, Jim Lovell, Richard Gordon, Buzz Aldrin, and Dave Scott. Wear to edges, rolled.

\$6,000 - 8,000



140



141



143

LARGE LUNAR NEAR SIDE CHART, SIGNED BY 20TH CENTURY SURFACE EXPLORERS.

LANDING DATE AND SITE NAME INSCRIPTIONS BY A MEMBER OF EVERY APOLLO LUNAR LANDING CREW.

Lunar Planning Chart (LOC - 2). Aeronautical Chart and Information Center, Edition 1, July 1969. Color lithographed moon map in Mercator projection. 29 x 49 inches. Scale 1:2,500,000 at the equator. Matted and framed.

BOLDLY INSCRIBED and SIGNED with:

"First Lunar Landing, Tranquillity Base, BUZZ ALDRIN, July 20, 1969"

"Ocean of Storms, ALAN BEAN Apollo XII LMP, Nov '69"

"Fra Mauro Base, EDGAR MITCHELL Apollo 14, Feb '71"

"Hadley Rille, DAVE SCOTT, Jul / Aug 1971/ Apollo 15"

"Descartes / Cayley Plains, CHARLES M. DUKE, JR., Apollo 16, April 1972"

and

"The Valley of Taurus Littrow, GENE CERNAN Apollo XVII, Dec '72."

A highly detailed lunar chart signed by a member of each Apollo lunar landing crew. In addition to their signatures and inscriptions, each astronaut has marked his landing site with either an "X" or a circle. All mare and large craters are labeled including unusual features such as rilles and ejecta rays. One of the largest lunar maps ever produced for NASA.

\$12,000 - 18,000

ASTRONAUT SIGNED DOCUMENTS.

Archive of documents signed by Apollo Astronauts, with correspondence requesting the documents from the astronauts, including:

1. *Log of Apollo 11*, NASA publication EP-72, 194 x 260 mm, 12 pp, self-wrappers, *SIGNED* by Michael Collins on p 2.
2. ANDERS, WILLIAM. *The Promise of Space*, pamphlet, extract from the *Atti Ufficiali Dell'XI Convegno Internazionale Sullo Spazio* (Official Proceedings of the XI International Convention on Space), Rome, 1971. 211 x 152 mm, 6 pp, printed wrappers, staple bound. *SIGNED* on the front wrapper: "William A. Anders — Apollo 8."
3. MITCHELL, EDGAR. *An Adventure in Consciousness*, offprint from *Psychic*, November/December 1972. 280 x 217 mm, 4 pp, self-wrappers. *SIGNED* on front page by Edgar Mitchell.
4. SCOTT, DAVE. *Mission Director's Summary Report, Apollo 15*. NASA reprint. 267 x 200 mm, 12 pp, self-wrappers. *SIGNED* by Scott on the front page.
5. SCHMITT, HARRISON. *Our Lunar Perspectives*. Xerographic copy, 267 x 204 mm, 3 pp recto only, stapled at top left corner. *SIGNED* at top margin by Harrison Schmitt.

WITH: Three Typed Letters Signed from Astronauts Dave Scott, Jim Irwin and Tom Stafford, regarding requests for signed materials.

\$800 - 1,200

145

SIGNED APOLLO CREW PHOTOS.

An archive of 29 signed photographs, comprising most of the Apollo program astronauts, as well as Mercury astronaut John Glenn, and rocket engineer Wernher von Braun. Signatures include Von Braun, Glenn, Aldrin, Armstrong, Anders, Bean, Borman, Cernan, Conrad, Cooper, Cunningham, Duke, Evans, Gordon, Haise, Irwin, Lovell, Mattingly, McDivitt, Mitchell, Roosa, Schmitt, Schweickart, Shepard, Slayton, Stafford, Swigert, Worden and Young. All on official NASA 8 x 10 inch (253 x 204 mm) portrait photographs, except Glenn and von Braun, on similarly sized photos without NASA markings. Borman photo creased, and Roosa slightly faded, otherwise fine condition.

\$2,500 - 3,500

146

OFFICIAL NASA APOLLO COLOR PHOTOLITHOGRAPH COLLECTION.

INCLUDES 12 LITHOS HAVING 15 ASTRONAUT AUTOGRAPHS.

11 color and 1 black and white 8 x 10 photolithographic prints with official NASA captions along the front white borders and on verso. The collection is comprised of:

- 1) Walt Cunningham Apollo 7 portrait in his blue aircraft flight suit next to a large Saturn IB rocket model. *SIGNED* by WALT CUNNINGHAM.
- 2) The Apollo 7 crew in their white space suits. *SIGNED* by WALLY SCHIRRA and WALT CUNNINGHAM.
- 3) The Apollo 9 crew in their white space suits at the Kennedy Space Center. *SIGNED* by JIM McDIVITT, DAVE SCOTT, and RUSTY SCHWEICKART who *INSCRIBES* "Apollo 9 LMP."
- 4) Four flight images from the Apollo 9 mission. *SIGNED* by DAVE SCOTT next to a photograph of him during his stand-up EVA.
- 5) Official NASA photolithograph released for the Apollo 11 fifth anniversary. *SIGNED* by BUZZ ALDRIN.
- 6) Fred Haise's Apollo 13 space suit portrait. *SIGNED* and *INSCRIBED*: "FRED HAISE, Apollo 13 LMP."
- 7) The Apollo 13 crew wearing coat and ties, including replacement astronaut John "Jack" Swigert. *SIGNED* by FRED W. HAISE, Jr.
- 8) Edgar Mitchell Apollo 14 space suit portrait. *SIGNED* and *INSCRIBED*: "EDGAR MITCHELL, Apollo 14, 6th man to walk on the moon."
- 9, 10, and 11) An Apollo 15 space suit crew portrait, a wide angle image of the Apollo 15 Saturn V launch, and a black/white image of Dave Scott on the moon with Hadley Rille in the background. *EACH SIGNED* by DAVE SCOTT.
- 12) Apollo XVII crew space suit portrait with a lunar rover and their Saturn V rocket at the Kennedy Space Center in the background. *SIGNED* and *INSCRIBED*: "GENE CERNAN, Apollo XVII."

\$1,000 - 1,500



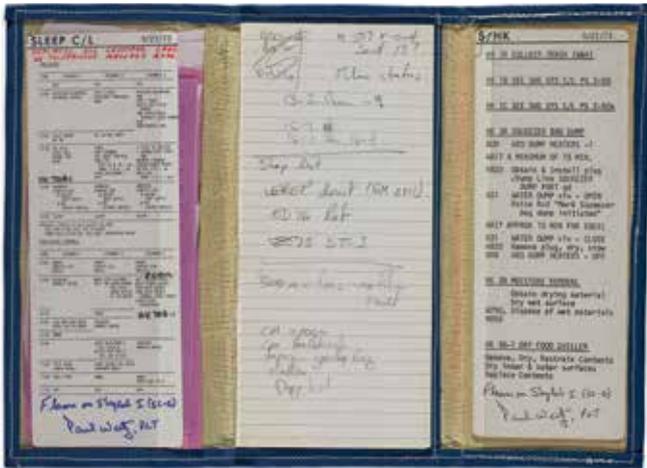
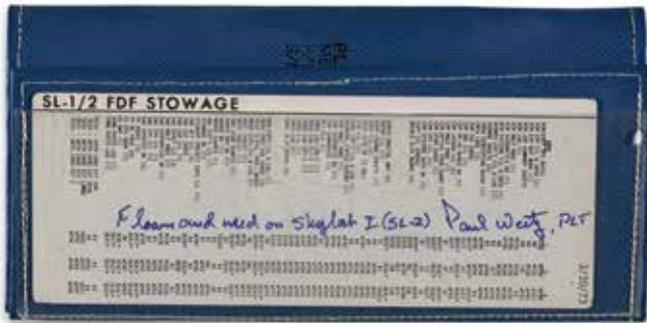
144



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147

SKYLAB FLOWN DAILY ACTIVITY BOOK.

PAUL WEITZ SKYLAB 2 TELEPRINTER BOOK WITH FLOWN CUE CARDS AND FLOWN PRINT-OUTS

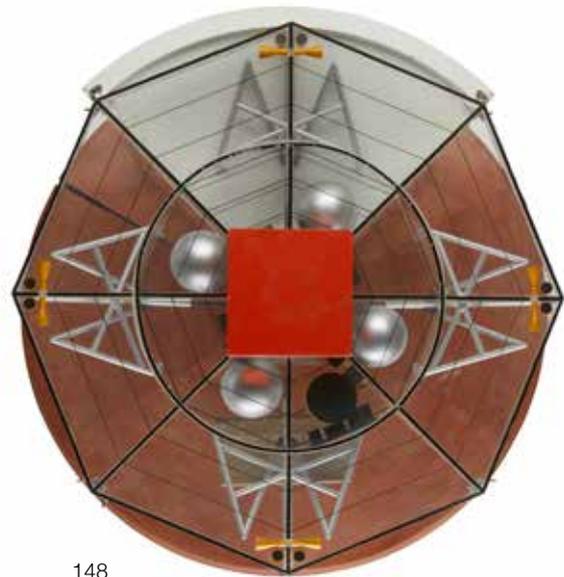
Blue vinyl tri-fold notebook, 9 x 12 1/2 inches open, 1973, with 3 side pockets and centered with notebook, labeled on the front flap: "PLT TELEPRINTER MESSAGE BOOK / P/N SKC 32100155-306 / S/N 1028"; with 3 flown 8 x 3 inch cue cards: "SLEEP C/L," "S/HK" and "SL-1/2 FDF STOWAGE" all signed ("Paul Weitz, PLT") and inscribed "Flown on Skylab I (SL-2)," autograph flight-related notes on 2 of the cards; and with 3 flown print-outs, 14 to 48 inches, each with flight-related notes and signed and inscribed by Weitz just as the cue cards; notebook, 8 1/4 x 3 3/4 inches, first page with penciled notes in Weitz's hand.

FLOWN 28 DAYS IN SPACE INSIDE THE SKYLAB SPACE STATION, Astronaut Paul Weitz's teleprinter message book was used on a daily basis, perfectly sized to place inside his jacket or the long leg pockets of his Durette inflight suit. Due to the repairs and changes to the mission after the loss of Skylab's micro-meteoroid/sun shield during the launch, Weitz found this book an essential tool to record and store many updates and flight plan changes. The cards included contain the sleep checklist which is a detailed, two-sided schedule of procedures for all three crewman; The standard housekeeping list and the flight data file stowage list - which lists items brought aboard the space station including the present book.

\$6,000 - 8,000



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VOYAGER SPACE PROBE CONTRACTOR'S MODEL.

Voyager Capsule Lander contractor's model, in acrylic and aluminum, on wooden base, with brass identification plate (detached) bearing Grumman logo, 21-3/4 inches diameter, 13-1/2 inches high, in wooden box.

Provenance:

Manufactured by a major aerospace model shop.

NASA's Voyager program consisted of two unmanned probes, Voyager 1 and 2, which were launched into the outer solar system and the edges of interstellar space. Launched in 1977, these probes are still transmitting data from beyond our solar system, having traveled farther from Earth than any other man-made objects.

\$2,000 - 3,000

149

SBIRS GEOSYNCHRONOUS ORBIT PAYLOAD MODEL.

Contractor's model in plastic, metal and glass, with black lexan base, bearing a plaque reading "Space Based Infrared System (SBIRS) High Component Geosynchronous Orbit Payload."

Provenance:

Manufactured by a major aerospace model shop.

The SBIRS system consists of multiple satellites in geosynchronous orbit with payloads that use visual and infrared surveillance to detect missile launches, gather intelligence, and provide vital information for the U.S. defense infrastructure.

\$1,000 - 1,500

150

ORBITAL SATELLITE CONTRACTOR'S MODEL.

Metal and plastic model of an unnamed orbital satellite, the main body made from a single piece of machined aluminum, on a black glass base. Approximately 10 inches across solar arrays.

Provenance:

Manufactured by a major aerospace model shop.

\$1,000 - 1,500

151

GRUMMAN SHUTTLE PROPOSAL NOSE DESIGN MODEL.

Half-hull space shuttle model with 3 interchangeable nose cones, in painted wood on wood plaque, circa 1972, 27 1/4 inches overall length, contained in a wood storage box.

Provenance:

Manufactured by a major aerospace model shop.

Different design proposals for the forward portion of space shuttle are demonstrated here with three detachable nose pieces starting from the forward edge of the wings. In 1972, NASA entertained proposals from Lockheed, Grumman, McDonnell Douglas, and North American Rockwell for space shuttle designs. North American Rockwell, who built the Apollo Command and Service Modules, was ultimately selected to build the shuttles.

\$2,000 - 3,000



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GRUMMAN SHUTTLE PROPOSAL MODEL.

Contractor's model in wood, with metal and glass base, of a proposed design for an orbital space shuttle, marked on base "Grumman — Design 518. 13-1/4 x 8-1/4 x 4-3/4 inches, excluding stand.

Provenance:

Manufactured by a major aerospace model shop.

Grumman's design proposal for the space shuttle program, Design #518, featured a delta wing and lift-generating body design, to be launched with a single re-usable booster that would return to Earth after launch. It was passed over by NASA because it was deemed to expensive compared to the proposal put forward by North American Rockwell.

\$2,000 - 3,000

153

BOB OVERMYER'S STS-5 CREW ACTIVITY PLAN.

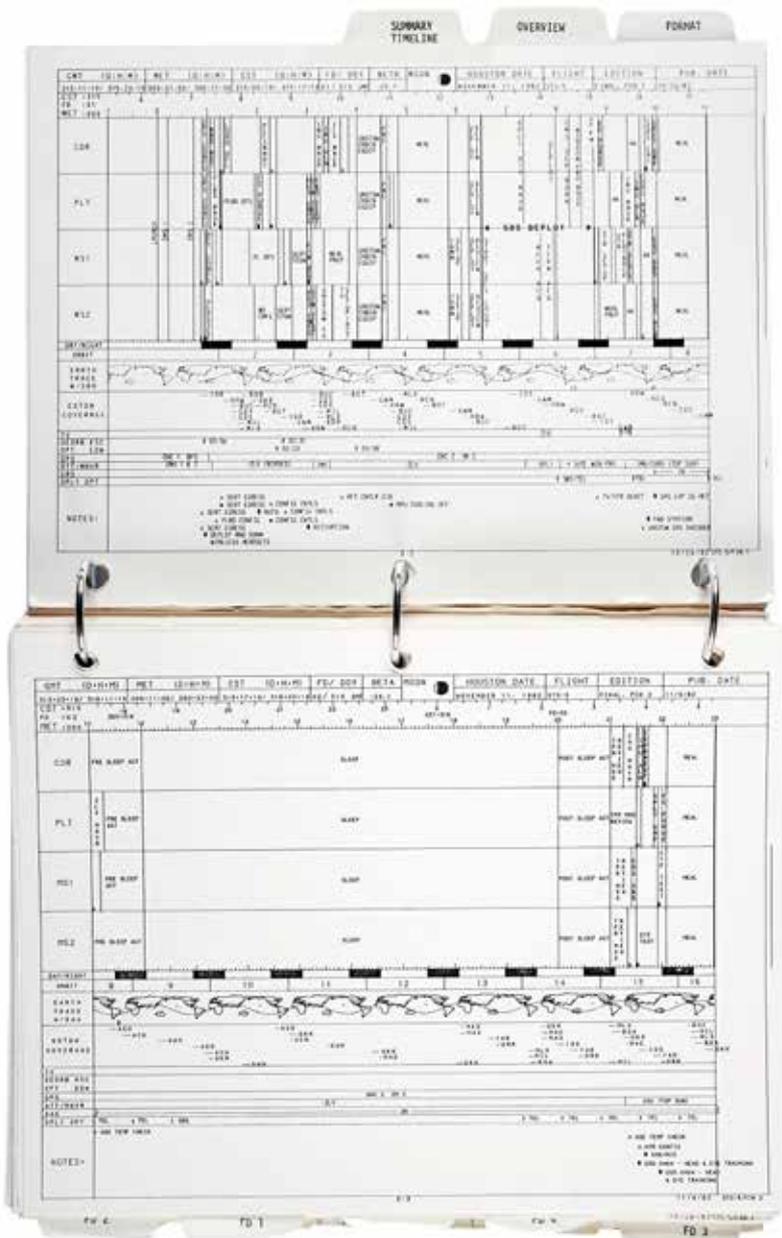
STS-5 Crew Activity Plan, 3-hole punched and bound with split rings, card covers and section dividers. Folding trajectory chart bound at back. The printed STS-5 (*Columbia*) mission emblem on the cover is overlaid with a color mission emblem sticker, and the interior bears numerous pencil notations by Overmyer.

Provenance:

The estate of Robert Overmyer (Aurora Galleries, April 2002, lot 631).

POSSIBLY FLOWN and used onboard *Columbia* by Overmyer on STS-5, this detailed activity plan bears his notes, some of them modifying the procedures on checklists. Overmyer did not sign the plan, nor did he leave any statement indicating whether or not it was flown. Bob Overmyer was a USMC pilot and NASA Astronaut who was selected for the support crew of Apollo 17, and served as CAPCOM for that mission at the launch. He later served in a similar capacity for the ASTP, and test duties for the shuttle program, before being assigned as pilot of STS-5 in 1982. He later commanded STS-51-B, and was on the team of investigators of the *Challenger* disaster. Overmyer died while testing a home built aircraft for the manufacturer, Cirrus Design, in March 1996. Accompanied by a descriptive note in the hand of Mrs. Overmyer.

\$1,500 - 2,500



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SPACE SHUTTLE WING LEADING EDGE PIECE.

Made from RCC (Reinforced Carbon/Carbon), 483 x 279 x 127 mm, with extensive darkening on surface from heat exposure, marked "V070-199897-002 — S/N 001 — 25167" and dated "3-13-1984" on interior structural panel of Inconel nickel-chromium alloy. Red spray-painted stripe across interior panel, indicating that the part was rejected and taken out of service.

The RCC material developed by Lockheed Martin for use on the wing leading edge panels was designed to withstand the tremendous heat of the shuttle's Mach 25 re-entry speed. A composite of carbon fibers in a carbon matrix, coated with a thin layer of silicon carbide (SiC), this material could be used for over 130 flights, but eventually would develop cracks in the SiC coating, exposing the carbon substrate to oxidation.



154

\$1,000 - 2,000

155

MCCANDLESS ON THE MMU.

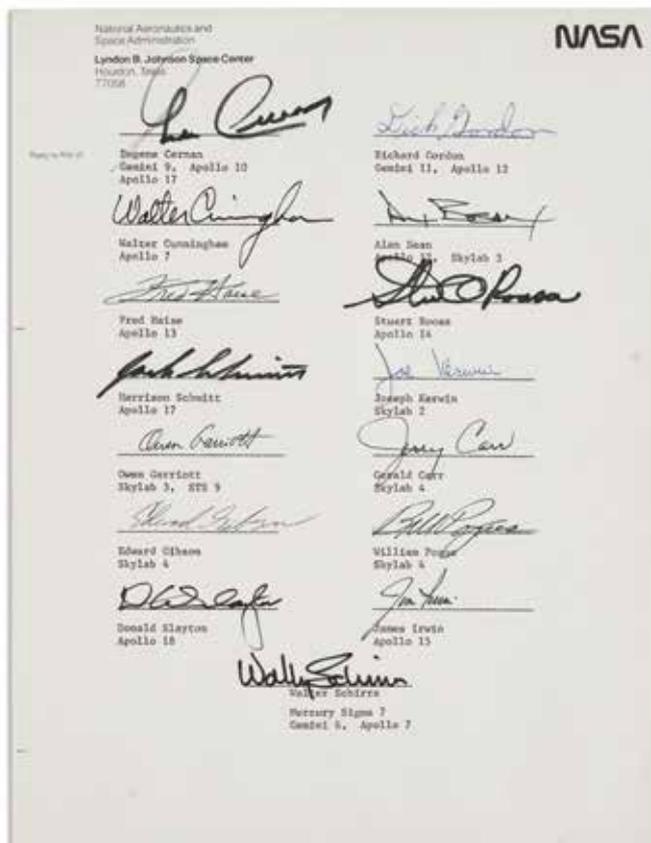
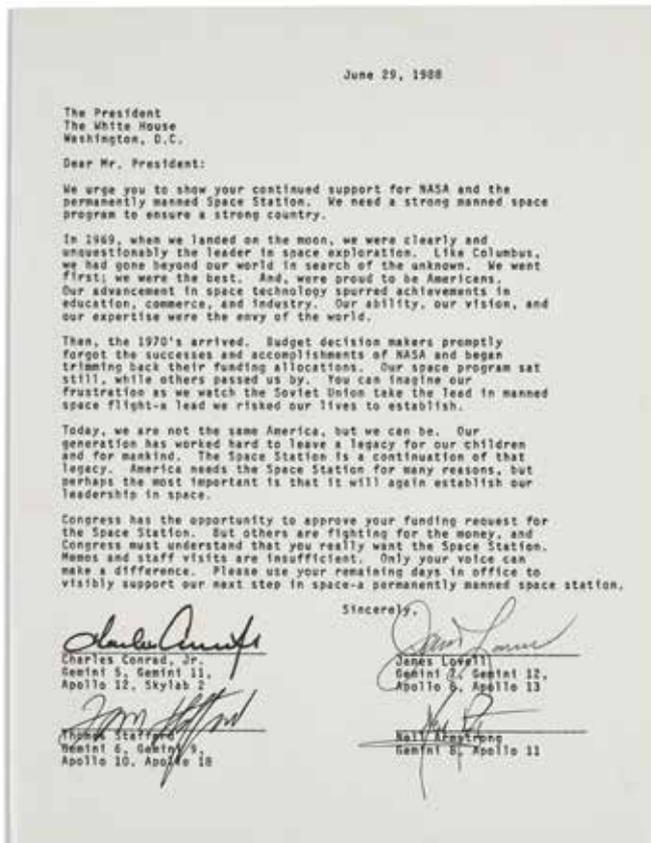
Color photograph, 16 x 20 inches (403 x 508 mm), SIGNED AND INSCRIBED by Bruce McCandless: "I made the first untethered spacewalk (EVA) on February 7, 1984. I was testing the Manned Maneuvering Unit (MMU) up to 320 feet away from Challenger. Gaseous nitrogen was the 326-pound MMU's propellant. It had 24 thrusters. — Bruce McCandless — STS 41-B." Together with two smaller (8 x 10 inch) photographs, showing McCandless holding this photo, and signing the photo along with others.

\$1,000 - 2,000



155

“Like Columbus, we had gone beyond our world in search of the unknown.”



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PETITION FOR SPACE STATION FREEDOM.

SIGNED BY 19 ASTRONAUTS INCLUDING NEIL ARMSTRONG AND MANY OTHERS FROM THE APOLLO PROGRAM.

Typed Letter Signed (“Neil Armstrong,” “Charles Conrad Jr.,” “James Lovell,” “Thomas Stafford,” “Gene Cernan,” “Dick Gordon,” “Walter Cunningham,” “Alan Bean,” “Fred Haise,” “Stuart Roosa,” “Jack Schmitt,” “Joe Kerwin,” “Owen Garriott,” “Gerald Carr,” “Edward Gibson,” “Bill Pogue,” “D.K. Slayton,” “Jim Irwin,” and “Wally Schirra”), 2 pages, 8 1/2 x 11 inches, Lyndon B. Johnson Space Center, Houston, June 29, 1988, to President Ronald Reagan, second page on NASA letterhead.

President Reagan announced plans to build Space Station Freedom in 1984 stating: “We can follow our dreams to distant stars, living and working in space for peaceful economic and scientific gain.” The Space Station had gone through a few redesigns by 1988 and the U.S. Congress was unwilling to direct funding toward its construction. The present letter was created to convince President Reagan in his final days in office to push the issue with Congress. In part: “In 1969, when we landed on the moon, we were clearly and unquestionably the leader in space exploration. Like Columbus, we had gone beyond our world in search of the unknown. We

went first; we were the best. And, were proud to be Americans. Our advancement in space technology spurred achievements in education, commerce, and industry. Our ability, our vision, and our expertise were the envy of the world. Then, the 1970's [sic] arrived. Budget decision makers promptly forgot the successes and accomplishments of NASA and began trimming back their funding allocations. Our space program sat still, while others passed us by. Today, we are not the same America, but we can be. Our generation has worked hard to leave a legacy for our children and for mankind. The Space Station is a continuation of that legacy. America needs the Space Station for many reasons, but perhaps the most important is that it will again establish our leadership in space.”

Although Space Station Freedom was never built, some of the plans were used for the U.S. portion of the International Space Station, which was launched into orbit in 1998.

\$18,000 - 25,000

END OF SALE

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If live online bidding is available for the subject auction, additional terms and conditions of sale relating to online bidding will apply; see www.bonhams.com/WebTerms for the supplemental terms. As used herein, "Bonhams," "we" and "us" refer to Bonhams & Butterfields Auctioneers Corp.

1. As used herein, the term "bid price" means the price at which a lot is successfully knocked down to the buyer. The term "purchase price" means the aggregate of (a) the bid price, (b) a PREMIUM retained by us and payable by the buyer (the "buyer's premium"), EQUAL TO 27.5% OF THE FIRST \$3,000 OF THE BID PRICE, 25% OF THE AMOUNT OF THE BID PRICE ABOVE \$3,000 UP TO AND INCLUDING \$400,000, 20% OF THE AMOUNT OF THE BID PRICE ABOVE \$400,000 UP TO AND INCLUDING \$4,000,000, AND 13.9% OF THE AMOUNT OF THE BID PRICE OVER \$4,000,000, and (c) unless the buyer is exempt by law from the payment thereof, any Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Iowa, Indiana, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Texas, Utah, Virginia, Washington, D.C., Washington, Wisconsin, Wyoming or other state or local sales tax (or compensating use tax) and other applicable taxes. With regard to New York sales tax, please refer to the "Sales and Use Tax" section of these Conditions of Sale.

2. In order to bid at the sale, prospective bidders must submit to Bonhams a completed bidder registration form (appearing at the end of this catalog) and any other requested information or references. New bidders and bidders who have not recently updated their registration information must pre-register to bid at least two business days before the sale. Individuals will be required to provide government-issued proof of identity and proof of address. Entity clients will be required to provide documentation including confirmation of entity registration showing the registered name, confirmation of registered address, documentary proof of officers and beneficial owners, proof of authority to transact on behalf of the entity and government-issued proof of identity for the individual who is transacting on the entity's behalf.

We may also request a financial reference and /or deposit from bidders before approving the bidder registration. In the event a deposit is submitted and you are not the successful bidder, your deposit will be returned to you. If you are the successful bidder, any such deposit will be credited to offset the appropriate portion of the purchase price.

We reserve the right to request further information, including regarding the source of funds, in order to complete bidder identification and registration procedures (including completing any anti-money laundering and/or anti-terrorism financing checks we may require) to our satisfaction. If our bidder identification and registration procedures are not satisfied, we may, in our sole discretion, decline to register any bidder or reject any bid or cancel any sale to such bidder.

Every bidder shall be deemed to act as a principal unless prior to the commencement of the sale there is a written acceptance by Bonhams of a bidder registration form completed and signed by the principal which clearly states that the authorized bidding agent is acting on behalf of the named principal. Absent such written acceptance by Bonhams, any person placing a bid as agent on behalf of another (whether or not such person has disclosed that fact or the identity of the principal) may be jointly and severally liable with the principal under any contract resulting from the acceptance of a bid. Every bidder shall be responsible for

any use of its assigned paddle or bidding account, regardless of the circumstances.

3. You represent and warrant that: (i) you have provided us with true and correct copies of valid identification and proof of residence and, if applicable, financial and/or corporate documents; (ii) neither you, your principal (if applicable, and subject to Bonhams' prior written acceptance pursuant to paragraph 2 above), nor any individual or entity with a beneficial or ownership interest in either or in the purchase transaction is on the Specially Designated Nationals List maintained by the Office of Foreign Assets Control of the U.S. Department of the Treasury nor subject to any other sanctions or embargo program or regulation in effect in the United States, European Union, England and Wales, or other applicable jurisdictions; (iii) if you are acting as an agent for a principal, you have conducted appropriate due diligence into such principal, and agree that Bonhams shall be entitled to rely upon such due diligence, you will retain adequate records evidencing such due diligence for a period of five (5) years following the consummation of the sale, and will make these records available for inspection upon Bonhams' request; (iv) neither the purchase transaction (including your bidding activity) nor the purchase funds are connected with nor derive from any criminal activity, and they are not designed to nor have they or shall they, violate the banking, anti-money laundering, or currency transfer laws or other regulations (including without limitation, import-export laws) of any country or jurisdiction, or further any other unlawful purpose, including without limitation collusion, anti-competitive activity, tax evasion or tax fraud.

You acknowledge and agree that we may rely upon the accuracy and completeness of the foregoing warranties.

4. On the fall of the auctioneer's hammer, the highest bidder shall have purchased the offered lot in accordance and subject to compliance with all of the conditions set forth herein and (a) assumes full risk and responsibility therefor, (b) if requested will sign a confirmation of purchase, and (c) will pay the purchase price in full or such part as we may require for all lots purchased. No lot may be transferred.

Unless otherwise agreed, payment in good, cleared funds is due and payable within five (5) business days following the auction sale. Whenever the buyer pays only a part of the total purchase price for one or more lots purchased, we may apply such payments, in our sole discretion, to the lot or lots we choose. Payment will not be deemed made in full until we have received good, cleared funds for all amounts due. Title in any purchased property will not pass until full and final payment has been received by Bonhams. Accounts must be settled in full before property is released to the buyer. In the event property is released earlier, such release will not affect the passing of title or the buyer's obligation to timely remit full payment.

We reserve the right to refuse to accept payment from a source other than the registered bidder or buyer of record. Once an invoice is issued, we cannot change the buyer's name on an invoice.

Payment for purchases must be made in the currency in which the sale is conducted and may be made in or by (a) cash, up to the amount of US \$5,000 (whether by single or multiple related payments), or the equivalent in the currency in which the sale is conducted, (b) cashier's check or money order, (c) personal check with approved credit drawn on a U.S. bank, (d) wire transfer or other immediate bank transfer, or (e) Visa, MasterCard, American Express or Discover credit, charge or debit card, provided that the registered bidder or buyer's name is printed on the card. A processing fee will be assessed on any returned checks.

To the fullest extent permitted by applicable law, the buyer grants us a security interest in the property, and we may retain as collateral security for the buyer's obligations to us, any property and all monies held or received by us for the account of the buyer, in our possession. We also retain all rights of a secured party under the California Commercial

Code, and you agree that we may file financing statements without your signature. If the foregoing conditions or any other applicable conditions herein are not complied with, in addition to all other remedies available to us and the consignor by law, we may at our election: (a) hold the buyer liable for the full purchase price and any late charges, collection costs, attorneys' fees and costs, expenses and incidental damages incurred by us or the consignor arising out of the buyer's breach; (b) cancel the sale, retaining as liquidated damages all payments made by the buyer; and/or (c) cancel the sale and/or resell the purchased property, at public auction and/or by private sale, and in such event the buyer shall be liable for the payment of all consequential damages, including any deficiencies or monetary losses, and all costs and expenses of such sale or sales, our commissions at our standard rates, all other charges due hereunder, all late charges, collection costs, attorneys' fees and costs, expenses and incidental damages. In addition, where two or more amounts are owed in respect of different transactions by the buyer to us, to Bonhams 1793 Limited and/or to any of our other affiliates, subsidiaries or parent companies worldwide within the Bonhams Group, we reserve the right to apply any monies paid in respect of a transaction to discharge any amount owed by the buyer. If all fees, commissions, premiums, bid prices and other sums due to us from the buyer are not paid promptly as provided in these Conditions of Sale, we reserve the right to impose a finance charge equal to 1.5% per month (or, if lower, the maximum nonusurious rate of interest permitted by applicable law), on all amounts due to us beginning on the 31st day following the sale until payment is received, in addition to other remedies available to us by law.

5. We reserve the right to withdraw any property and to divide and combine lots at any time before such property's auction. Unless otherwise announced by the auctioneer at the time of sale, all bids are per lot as numbered in the catalog and no lots shall be divided or combined for sale.

6. We reserve the right to reject a bid from any bidder, to split any bidding increment, and to advance the bidding in any manner the auctioneer may decide. In the event of any dispute between bidders, or in the event the auctioneer doubts the validity of any bid, the auctioneer shall have sole and final discretion either to determine the successful bidder, re-open the bidding, or to cancel the sale and re-offer and resell the article in dispute. If any dispute arises after the sale, our sales records shall be conclusive in all respects.

We further reserve the right to cancel the sale of any property if (i) you are in breach of your representations and warranties as set forth in paragraph 3 above; (ii) we, in our sole discretion, determine that such transaction might be unlawful or might subject Bonhams or the consignor to any liability to any third party; or (iii) there are any other grounds for cancellation under these Conditions of Sale.

7. If we are prevented by fire, theft or any other reason whatsoever from delivering any property to the buyer or a sale otherwise cannot be completed, our liability shall be limited to the sum actually paid therefor by the buyer and shall in no event include any compensatory, incidental or consequential damages.

8. All lots in the catalog are offered subject to a reserve unless otherwise indicated in the catalog. The reserve is the confidential minimum bid price at which such lot will be sold and it does not to exceed the low estimate value for the lot. If a lot is offered subject to a reserve, we may implement such reserve by bidding on behalf of the consignor, whether by opening bidding or continuing bidding in response to other bidders until reaching the reserve. If we have an interest in an offered lot and the proceeds therefrom other than our commissions, we may bid up to the reserve to protect such interest. If the auctioneer determines that any opening or subsequent bid is below the reserve for a lot, (s)he may reject such opening bid and withdraw the item from sale. CONSIGNORS ARE NOT ALLOWED TO BID ON THEIR OWN ITEMS.

Conditions of sale - continued

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For an additional fee, Bonhams may provide packing and shipping services for certain items as noted in the "Buyer's Guide" section of the catalog.

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13. These Conditions of Sale shall bind the successors and assigns of all bidders and buyers and inure to the benefit of our successors and assigns. No waiver, amendment or modification of the terms hereof (other than posted notices or oral announcements during the sale) shall bind us unless specifically stated in writing and signed by us. No act or omission of Bonhams, its employees or agents, nor any failure thereof to exercise any remedy hereunder, shall operate or be deemed to operate as a waiver of Bonhams' rights under these Conditions of Sale. If any part of these Conditions of Sale is for any reason invalid or unenforceable, the rest shall remain valid and enforceable.

14. These Conditions of Sale and the buyer's and our respective rights and obligations hereunder shall be governed

by and construed and enforced in accordance with the laws of the State of California. Any dispute, controversy or claim arising out of or relating to this agreement, or the breach, termination or validity thereof, brought by or against Bonhams (but not including claims brought against the consignor by the buyer of lots consigned hereunder) shall be resolved by the procedures set forth below.

15. You accept and agree that Bonhams will hold and process your personal information and may share and use it as required by law and as described in, and in line with Bonhams' Privacy Policy, available at website at www.bonhams.com/legals/. If you desire access, update, or restriction to the use of your personal information, please email data.protection@bonhams.com.

SALES AND USE TAX

New York sales tax is charged on the hammer price, buyer's premium and any other applicable charges on any property collected or delivered in New York State, regardless of the state or country in which the buyer resides or does business. Buyers who make direct arrangements for collection by a shipper who is considered a "private" or "contract" carrier by the New York Department of Taxation and Finance will be charged New York sales tax, regardless of the destination of the property. Property collected for delivery to a destination outside of New York by a shipper who is considered a "common carrier" by the New York Department of Taxation and Finance (e.g. United States Postal Service, United Parcel Service, and FedEx) is not subject to New York sales tax, but if it is delivered into any state in which Bonhams is registered or otherwise conducts business sufficient to establish a nexus, Bonhams may be required by law to collect and remit the appropriate sales tax in effect in such state. Property collected for delivery outside of the United States by a freight forwarder who is registered with the Transportation Security Administration ("TSA") is not subject to New York sales tax.

MEDIATION AND ARBITRATION PROCEDURES

(a) Within 30 days of written notice that there is a dispute, the parties or their authorized and empowered representatives shall meet by telephone and/or in person to mediate their differences. If the parties agree, a mutually acceptable mediator shall be selected and the parties will equally share such mediator's fees. The mediator shall be a retired judge or an attorney familiar with commercial law and trained in or qualified by experience in handling mediations. Any communications made during the mediation process shall not be admissible in any subsequent arbitration, mediation or judicial proceeding. All proceedings and any resolutions thereof shall be confidential, and the terms governing arbitration set forth in paragraph (c) below shall govern.

(b) If mediation does not resolve all disputes between the parties, or in any event no longer than 60 days after receipt of the written notice of dispute referred to above, the parties shall submit the dispute for binding arbitration before a single neutral arbitrator. Such arbitrator shall be a retired judge or an attorney familiar with commercial law and trained in or qualified by experience in handling arbitrations. Such arbitrator shall make all appropriate disclosures required by law. The arbitrator shall be drawn from a panel of a national arbitration service agreed to by the parties, and shall be selected as follows: (i) If the national arbitration service has specific rules or procedures, those rules or procedures shall be followed; (ii) If the national arbitration service does not have rules or procedures for the selection of an arbitrator, the arbitrator shall be an individual jointly agreed to by the parties. If the parties cannot agree on a national arbitration service, the arbitration shall be conducted by the American Arbitration Association, and the arbitrator shall be selected in accordance with the Rules of the American Arbitration Association. The arbitrator's award shall be in writing and shall set forth findings of fact and legal conclusions.

(c) Unless otherwise agreed to by the parties or provided by the published rules of the national arbitration service:

(i) the arbitration shall occur within 60 days following the selection of the arbitrator;

(ii) the arbitration shall be conducted in the designated location, as follows: (A) in any case in which the subject auction by Bonhams took place or was scheduled to take place in the State of New York or Connecticut or the Commonwealth of Massachusetts, the arbitration shall take place in New York City, New York; (B) in all other cases, the arbitration shall take place in the city of San Francisco, California; and

(iii) discovery and the procedure for the arbitration shall be as follows:

(A) All arbitration proceedings shall be confidential;

(B) The parties shall submit written briefs to the arbitrator no later than 15 days before the arbitration commences;

(C) Discovery, if any, shall be limited as follows: (i) Requests for no more than 10 categories of documents, to be provided to the requesting party within 14 days of written request thereof; (ii) No more than two (2) depositions per party, provided however, the deposition(s) are to be completed within one (1) day; (iii) Compliance with the above shall be enforced by the arbitrator in accordance with California law;

(D) Each party shall have no longer than eight (8) hours to present its position. The entire hearing before the arbitrator shall not take longer than three (3) consecutive days;

(E) The award shall be made in writing no more than 30 days following the end of the proceeding. Judgment upon the award rendered by the arbitrator may be entered by any court having jurisdiction thereof.

To the fullest extent permitted by law, and except as required by applicable arbitration rules, each party shall bear its own attorneys' fees and costs in connection with the proceedings and shall share equally the fees and expenses of the arbitrator.

LIMITED RIGHT OF RESCISSION

If within one (1) year from the date of sale, the original buyer (a) gives written notice to us alleging that the identification of Authorship (as defined below) of such lot as set forth in the **BOLD TYPE** heading of the catalog description of such lot (as amended by any saleroom notices or verbal announcements during the sale) is not substantially correct based on a fair reading of the catalog (including the terms of any glossary contained therein), and (b) within 10 days after such notice returns the lot to us in the same condition as at the time of sale, and (c) establishes the allegation in the notice to our satisfaction (including by providing one or more written opinions by recognized experts in the field, as we may reasonably require), then the sale of such lot will be rescinded and, unless we have already paid to the consignor monies owed him in connection with the sale, the original purchase price will be refunded.

If, prior to receiving such notice from the original buyer alleging such defect, we have paid the consignor monies owed him in connection with the sale, we shall pay the original buyer the amount of our commissions, any other sale proceeds to which we are entitled and applicable taxes received from the buyer on the sale and make demand on the consignor to pay the balance of the original purchase price to the original buyer. Should the consignor fail to pay such amount promptly, we may disclose the identity of the consignor and assign to the original buyer our rights against the consignor with respect to the lot the sale of which is sought to be rescinded. Upon such disclosure and assignment, any liability of Bonhams as consignor's agent with respect to said lot shall automatically terminate.

The foregoing limited right of rescission is available to the original buyer only and may not be assigned to or relied

Conditions of sale - continued

upon by any subsequent transferee of the property sold. The buyer hereby accepts the benefit of the consignor's warranty of title and other representations and warranties made by the consignor for the buyer's benefit. Nothing in this section shall be construed as an admission by us of any representation of fact, express or implied, obligation or responsibility with respect to any lot. **THE BUYER'S SOLE AND EXCLUSIVE REMEDY AGAINST BONHAMS FOR ANY REASON WHATSOEVER IS THE LIMITED RIGHT OF RESCISSION DESCRIBED IN THIS SECTION.**

"Authorship" means only the identity of the creator, the period, culture and source or origin of the lot, as the case may be, as set forth in the **BOLD TYPE** heading of the print catalog entry. The right of rescission does not extend to: (a) works of art executed before 1870 (unless these works are determined to be counterfeits created since 1870), as this is a matter of current scholarly opinion which can change; (b) titles, descriptions, or other identification of offered lots, which information normally appears in lower case type below the **BOLD TYPE** heading identifying the Authorship; (c) Authorship of any lot where it was specifically mentioned that there exists a conflict of specialist or scholarly opinion regarding the Authorship of the lot at the time of sale; (d) Authorship of any lot which as of the date of sale was in accordance with the then generally-accepted opinion of scholars and specialists regarding the same; or (e) the identification of periods or dates of creation in catalog descriptions which may be proven inaccurate by means of scientific processes that are not generally accepted for use until after publication of the catalog in which the property is offered or that were unreasonably expensive or impractical to use at the time of such publication.

LIMITATION OF LIABILITY

EXCEPT AS EXPRESSLY PROVIDED ABOVE, ALL PROPERTY IS SOLD "AS IS." NEITHER BONHAMS NOR THE CONSIGNOR MAKES ANY REPRESENTATION

OR WARRANTY, EXPRESS OR IMPLIED, AS TO THE MERCHANTABILITY, FITNESS OR CONDITION OF THE PROPERTY OR AS TO THE CORRECTNESS OF DESCRIPTION, GENUINENESS, ATTRIBUTION, PROVENANCE OR PERIOD OF THE PROPERTY OR AS TO WHETHER THE BUYER ACQUIRES ANY COPYRIGHTS OR OTHER INTELLECTUAL PROPERTY RIGHTS IN LOTS SOLD OR AS TO WHETHER A WORK OF ART IS SUBJECT TO THE ARTIST'S MORAL RIGHTS OR OTHER RESIDUAL RIGHTS OF THE ARTIST. THE BUYER EXPRESSLY ACKNOWLEDGES AND AGREES THAT IN NO EVENT SHALL BONHAMS BE LIABLE FOR ANY DAMAGES INCLUDING, WITHOUT LIMITATION, ANY COMPENSATORY, INCIDENTAL OR CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL THE AGGREGATE LIABILITY OF BONHAMS AND ITS CONSIGNOR TO A PURCHASER EXCEED THE PURCHASE PRICE ACTUALLY PAID FOR A DISPUTED ITEM OF PROPERTY.

Seller's guide

SELLING AT AUCTION

Bonhams can help you every step of the way when you are ready to sell art, antiques and collectible items at auction. Our regional offices and representatives throughout the US are available to service all of your needs. Should you have any further questions, please visit our website at www.bonhams.com/us for more information or call our Client Services Department at +1 (212) 644 9001.

AUCTION ESTIMATES

The first step in the auction process is to determine the auction value of your property. Bonhams' world-renowned specialists will evaluate your special items at no charge and in complete confidence. You can obtain an auction estimate in many ways:

- Attend one of our Auction Evaluation Events held regularly at our galleries and in other major metropolitan areas. The updated schedule for Bonhams Auction Evaluation Events is available at www.bonhams.com/us.
- Call our Client Services Department to schedule a private appointment at one of our galleries. If you have a large collection, our specialists can travel, by appointment, to evaluate your property on site.
- Send clear photographs to us of each individual item, including item dimensions and other pertinent information with each picture. Photos should be sent to Bonhams' address in envelopes marked as "photo auction estimate". Alternatively, you can submit your request using our online form at www.bonhams.com/us. Digital images may be attached to the form. Please limit your images to no more than five (5) per item.

CONSIGNING YOUR PROPERTY

After you receive an estimate, you may consign your property to us for sale in the next appropriate auction. Our staff assists you throughout the process, arranging transportation of your items to our galleries (at the consignor's expense), providing a detailed inventory of your consignment, and reporting the prices realized for each lot. We provide secure storage for your property in our warehouses and all items are insured throughout the auction process. You will receive payment for your property approximately 35 days after completion of sale.

Sales commissions vary with the potential auction value of the property and the particular auction in which the property is offered. Please call us for commission rates.

PROFESSIONAL APPRAISAL SERVICES

Bonhams' specialists conduct insurance and fair market value appraisals for private collectors, corporations, museums, fiduciaries and government entities on a daily basis. Insurance appraisals, used for insurance purposes, reflect the cost of replacing property in today's retail market. Fair market value appraisals are used for estate, tax and family division purposes and reflect prices paid by a willing buyer to a willing seller.

When we conduct a private appraisal, our specialists will prepare a thorough inventory listing of all your appraised property by category. Valuations, complete descriptions and locations of items are included in the documentation.

Appraisal fees vary according to the nature of the collection, the amount of work involved, the travel distance, and whether the property is subsequently consigned for auction.

Our appraisers are available to help you anywhere and at any time. Please call our Client Services Department to schedule an appraisal.

ESTATE SERVICES

Since 1865, Bonhams has been serving the needs of fiduciaries – lawyers, trust officers, accountants and executors – in the disposition of large and small estates. Our services are specially designed to aid in the efficient appraisal and disposition of fine art, antiques, jewelry, and collectibles. We offer a full range of estate services, ranging from flexible financial terms to tailored accounting for heirs and their agents to world-class marketing and sales support.

For more information or to obtain a detailed Trust and Estates package, please visit our website at www.bonhams.com/us or contact our Client Services Department.

Buyer's guide

BIDDING & BUYING AT AUCTION

Whether you are an experienced bidder or an enthusiastic novice, auctions provide a stimulating atmosphere unlike any other. Bonhams previews and sales are free and open to the public. As you will find in these directions, bidding and buying at auction is easy and exciting. Should you have any further questions, please visit our website at www.bonhams.com or call our Client Services Department at +1 (212) 644 9001.

Catalogs

Before each auction we publish illustrated catalogs. Our catalogs provide descriptions and estimated values for each "lot." A lot may refer to a single item or to a group of items auctioned together. The catalogs also include the dates and the times for the previews and auctions. We offer our catalogs by subscription or by single copy. For information on subscribing to our catalogs, you may refer to the subscription form in this catalog, call our Client Services Department, or visit our website at www.bonhams.com/us.

Previews

Auction previews are your chance to inspect each lot prior to the auction. We encourage you to look closely and examine each object on which you may want to bid so that you will know as much as possible about it. Except as expressly set forth in the Conditions of Sale, items are sold "as is" and with all faults; illustrations in our catalogs, website and other materials are provided for identification only. At the previews, our staff is always available to answer your questions and guide you through the auction process. Condition reports may be available upon request.

Estimates

Bonhams catalogs include low and high value estimates for each lot, exclusive of the buyer's premium and tax. The estimates are provided as an approximate guide to current market value based primarily on previous auction results for comparable pieces, and should not be interpreted as a representation or prediction of actual selling prices. They are determined well in advance of a sale and are subject to revision. Please contact us should you have any questions about value estimates.

Reserves

Unless indicated by the σ symbol next to the lot number, which denotes no reserve, all lots in the catalog are subject to a reserve. The reserve is the minimum auction price that the consignor is willing to accept for a lot. This amount is confidential and does not exceed the low estimate value.

Auction House's Interest in Property Offered at Auction

On occasion, Bonhams may offer property in which it has an ownership interest in whole or in part or otherwise has an economic interest. Such property, if any, is identified in the catalog with a \blacktriangle symbol next to the lot number(s).

Bonhams may also offer property for a consignor that has been guaranteed a minimum price for its property by Bonhams or jointly by Bonhams and a third party. Bonhams and any third parties providing a guarantee may benefit financially if the guaranteed property is sold successfully and may incur a financial loss if its sale is not successful. Such property, if any, is identified in the catalog with a \circ symbol next to the lot number(s).

Bidding at Auction

At Bonhams, you can bid in many ways: in person, via absentee bid, over the phone, or via Bonhams' live online bidding facility. Absentee bids can be submitted in person, online, via fax or via email.

Valid Bonhams client accounts are required to participate in bidding activity. You can obtain registration information online, at the reception desk or by calling our Client Services Department.

By bidding at auction, whether in person or by agent, by absentee bid, telephone, online or other means, the buyer or bidder agrees to be bound by the Conditions of Sale.

Lots are auctioned in consecutive numerical order as they appear in the catalog. Bidding normally begins below the low estimate. The auctioneer will accept bids from interested

parties present in the saleroom, from telephone bidders, and from absentee bidders who have left written bids in advance of the sale. The auctioneer may also execute bids on behalf of the consignor by placing responsive or consecutive bids for a lot up to the amount of the reserve, but never above it.

We assume no responsibility for failure to execute bids for any reason whatsoever.

In Person

If you are planning to bid at auction for the first time, you will need to register at the reception desk in order to receive a numbered bid card. To place a bid, hold up your card so that the auctioneer can clearly see it. Decide on the maximum auction price that you wish to pay, exclusive of buyer's premium and tax, and continue bidding until your bid prevails or you reach your limit. If you are the successful bidder on a lot, the auctioneer will acknowledge your paddle number and bid amount.

Absentee Bids

As a service to those wishing to place bids, we may at our discretion accept bids without charge in advance of auction online or in writing on bidding forms available from us. "Buy" bids will not be accepted; all bids must state the highest bid price the bidder is willing to pay. Our auction staff will try to bid just as you would, with the goal of obtaining the item at the lowest bid price possible. In the event identical bids are submitted, the earliest bid submitted will take precedence. Absentee bids shall be executed in competition with other absentee bids, any applicable reserve, and bids from other auction participants. A friend or agent may place bids on your behalf, provided that we have received your written authorization prior to the sale. Absentee bid forms are available in our catalogs, online at www.bonhams.com/us, at offsite auction locations, and at our San Francisco, Los Angeles and New York galleries.

By Telephone

Under special circumstances, we can arrange for you to bid by telephone. To arrange for a telephone bid, please contact our Client Services Department a minimum of 24 hours prior to the sale.

Online

We offer live online bidding for most auctions and accept absentee bids online for all our auctions. Please visit www.bonhams.com/us for details.

Bid Increments

Bonhams generally uses the following increment multiples as bidding progresses:

\$50-200.....	by \$10s
\$200-500.....	by \$20/50/80s
\$500-1,000.....	by \$50s
\$1,000-2,000.....	by \$100s
\$2,000-5,000.....	by \$200/500/800s
\$5,000-10,000.....	by \$500s
\$10,000-20,000.....	by \$1,000s
\$20,000-50,000.....	by \$2,000/5,000/8,000s
\$50,000-100,000.....	by \$5,000s
\$100,000-200,000.....	by \$10,000s
above \$200,000.....	at auctioneer's discretion

The auctioneer may split or reject any bid at any time at his or her discretion as outlined in the Conditions of Sale.

Currency Converter

Solely for the convenience of bidders, a currency converter may be provided at Bonhams' auctions. The rates quoted for conversion of other currencies to U.S. Dollars are indications only and should not be relied upon by a bidder, and neither Bonhams nor its agents shall be responsible for any errors or omissions in the operation or accuracy of the currency converter.

Buyer's Premium

A buyer's premium is added to the winning bid price of each individual lot purchased, at the rates set forth in the Conditions of Sale. The winning bid price plus the premium constitute the purchase price for the lot. Applicable sales taxes are computed based on this figure, and the total becomes your final purchase price.

Unless specifically illustrated and noted, fine art frames are not included in the estimate or purchase price. Bonhams accepts no liability for damage or loss to frames during storage or shipment.

All sales are final and subject to the Conditions of Sale found in our catalogs, on our website, and available at the reception desk.

Payment

All buyers are asked to pay and pick up by 3pm on the business day following the auction. Payment may be made to Bonhams by cash, checks drawn on a U.S. bank, money order, wire transfer, or by Visa, MasterCard, American Express or Discover credit or charge card or debit card. All items must be paid for within 5 business days of the sale. Please note that payment by personal or business check may result in property not being released until purchase funds clear our bank. For payments sent by mail, please remit to Cashier Department, 220 San Bruno Avenue, San Francisco, CA 94103.

Sales Tax

Residents of states listed in Paragraph 1 of the Conditions of Sale must pay applicable sales tax. Other state or local taxes (or compensation use taxes) may apply. Sales tax will be automatically added to the invoice unless a valid resale number has been furnished or the property is shipped via common carrier to destinations outside the states listed in the Conditions of Sale. If you wish to use your resale license please contact Cashiers for our form.

Shipping & Removal

Bonhams can accommodate shipping for certain items. Please contact our Cashiers Department for more information or to obtain a quote. Carriers are not permitted to deliver to PO boxes.

International buyers are responsible for all import/export customs duties and taxes. An invoice stating the actual purchase price will accompany all international purchases.

Collection of Purchases

Please arrange for the packing and transport of your purchases prior to collection at our office. If you are sending a third party shipper, please request a release form from us and return it to +1 (212) 644 9009 prior to your scheduled pickup. To schedule collection of purchases, please call +1 (212) 644 9001.

Handling and Storage Charges

Please note that our office has requirement for freight elevator usage. Please contact us to schedule an elevator appointment for pickup of any large or awkward items. On Thursday 26 September oversized lots (noted as W next to the lot number and/or listed on page 79) will be sent to Door to Door Services where transfer and full value protection fees will be immediately applicable. Storage charges will begin accruing for any lots not collected within 5 business days of the date of auction. All other sold lot will be retained in Bonhams Gallery until Thursday 26 September. Collection of lots will be by appointment only. Please call +1 (212) 644 9001 at least 24 hours in advance to make an appointment.

Storage charges of \$5 per lot, per day will begin accruing for any lots not collected within 14 calendar days. Bonhams Reserve the right to remove uncollected sold lots to the warehouse of our choice at the buyer's risk and expense. Further transfer, handling, storage and full value protection fees will apply if move to a warehouse of our choice.

Auction Results

All you need is a touch-tone telephone and the lot number. Auction results are usually available on the next business day following the sale or online at www.bonhams.com/us.

Important notice to buyers

COLLECTION & STORAGE AFTER SALE

Please note that all oversized lots listed below and marked with a W in the catalogue will be removed to the warehouse of Door to Door Services herein referred to as Door To Door on Thursday 26 September. Lots not so listed will remain at Bonhams.

W LOTS WILL BE AVAILABLE FOR COLLECTION FROM DOOR TO DOOR BEGINNING AT 9AM ET ON FRIDAY 27 SEPTEMBER.

Address

Door To Door Services
50 Tannery Rd #8A
Somerville, NJ 08876

Lots will be available for collection 24hrs following transfer to Door to Door every business day from 9am to 5pm ET.

Collections appointments must be booked 24 hours in advance (subject to full payment of all outstanding amounts due to Bonhams and Door To Door) by contacting Door To Door at 1-908-707-0077 ext 2070

HANDLING & STORAGE CHARGES

Please note: For sold lots removed to Door To Door there will be transfer and Full value protection charges but no storage charge due for lots collected within 5 days of the auction. For sold lots that remain at Bonhams, there will be no storage charge for lots collected within 21 days of the sale date.

The per-lot charges levied by Door To Door Services are as follows (plus any applicable sales tax):

FURNITURE/LARGE OBJECTS

Transfer \$75
Daily storage..... \$10
Insurance (on Hammer + Premium + tax) 0.3%

SMALL OBJECTS

Transfer \$37.50
Daily storage..... \$5
Insurance (on Hammer + Premium + tax) 0.3%

Please contact Michael Van Dyke at Door To Door
+1 908 707 0077 ext 2070
+1 908 707 0011 (fax)
quotes@dtdusa.com

For more information and estimates on domestic and International shipping Please contact Michael Van Dyke at Door To Door
+1 908 707 0077 ext 2070
+1 908 707 0011 (fax)
quotes@dtdusa.com

PAYMENT

All amounts due to Bonhams and all charges due to Door To Door Services must be paid by the time of collection of the property from their warehouse.

TO MAKE PAYMENT IN ADVANCE

Telephone +1 (908) 707 0077 ext 2070 to ascertain the amount due, payable by cash, check, or credit card.

PAYMENT AT TIME OF COLLECTION

May be made by cash, check, or credit card.

Lots will only be released from Door To Door's warehouse upon production of the "Collection Slip" obtained from the Cashier's office at Bonhams.

The removal and/or storage by Door To Door of any lots will be subject to their standard Conditions of Business, copies of which are available at Bonhams.

PLEASE NOTE

Door To Door does not accept liability for damage or loss, due to negligence or otherwise, exceeding the sale price of such goods, or at their option the cost of repairing or replacing the damaged or missing goods.

Door To Door reserves a lien over all goods in their possession for payment of storage and all other charges due them.

Oversized lots

6	30
7	31
8	32
9	34
12	36
15	46
16	56
17	58
18	69
19	70
21	76
26	148
27	151
29	

Bonhams Specialist Departments

19th Century Paintings

London
Charles O' Brien
+44 20 7468 8360
New York
Madalina Lazen
+1 212 644 9108

20th Century British Art

London
Matthew Bradbury
+44 20 7468 8295

20th Century Fine Art

San Francisco
Sonja Moro
+1 415 694 9002

Aboriginal Art

Australia
Francesca Cavazzini
+61 2 8412 2222

African, Oceanic & Pre-Columbian Art

Los Angeles
Fredric W. Backlar
+1 323 436 5416 •

American Paintings

New York
Jennifer Jacobsen
+1 917 206 1699

Antiquities

London
Francesca Hickin
+44 20 7468 8226

Antique Arms & Armour

London
David Williams
+44 20 7393 3807

Art Collections, Estates & Valuations

London
Harvey Cammell
+44 (0) 20 7468 8340
New York
Sherri Cohen
+1 917 206 1671
Los Angeles
Leslie Wright
+1 323 436 5408
Joseph Francaviglia
+1 323 436 5443
Lydia Ganley
+1 323 436 4496
San Francisco
Victoria Richardson
+1 415 503 3207
Celeste Smith
+1 415 503 3214

Australian Art

Australia
Merryn Schriever
+61 2 8412 2222 Alex Clark
+61 3 8640 4088

Australian Colonial Furniture and Australiana

+61 2 8412 2222

Books, Maps & Manuscripts

London
Matthew Haley
+44 20 7393 3817
New York
Ian Ehling
+1 212 644 9094 Darren Sutherland
+1 212 461 6531
Los Angeles
Catherine Williamson
+1 323 436 5442
San Francisco
Adam Stackhouse
+1 415 503 3266

British & European Glass

London
Fergus Gambon
+44 20 7468 8245

British Ceramics

London
Fergus Gambon
+44 20 7468 8245

California & Western Paintings & Sculpture

Los Angeles
Scot Levitt
+1 323 436 5425
Kathy Wong
+1 323 436 5415
San Francisco
Aaron Bastian
+1 415 503 3241

Carpets

London
Helena Gumley-Mason
+44 20 8393 2615

Chinese & Asian Art

London
Asaph Hyman
+44 20 7468 5888
Rosangela Assennato
+44 20 7393 3883
Edinburgh
Ian Glennie
+44 131 240 2299
New York
Bruce MacLaren
+1 917 206 1677
Los Angeles
Rachel Du
+1 323 436 5587
San Francisco
Dessa Goddard
+1 415 503 3333
Hong Kong
Xibo Wang
+852 3607 0010
Sydney
Yvett Klein
+61 2 8412 2231

Chinese Paintings

Hong Kong
Iris Miao,
+852 3607 0011

Clocks

London
James Stratton
+44 20 7468 8364
New York
Jonathan Snellenburg
+1 212 461 6530

Coins & Medals

London
John Millensted
+44 20 7393 3914
Los Angeles
Paul Song
+1 323 436 5455

Entertainment Memorabilia

London
Katherine Schofield
+44 20 7393 3871
Los Angeles
Catherine Williamson
+1 323 436 5442
Dana Hawkes
+1 978 283 1518

European Ceramics

London
Sebastian Kuhn
+44 20 7468 8384

European Paintings

London
Charles O' Brien
+44 20 7468 8360
New York
Madalina Lazen
+1 212 644 9108
Los Angeles
Mark Fisher
+1 323 436 5488
Rocco Rich
+1 323 436 5410

European Sculptures & Works of Art

London
Michael Lake
+44 20 8963 6813

Furniture and Decorative Art

London
Thomas Moore
+44 20 8963 2816
Los Angeles
Angela Past
+1 323 436 5422
Anna Hicks
+1 323 436 5463
San Francisco
Jeffrey Smith
+1 415 215 7385

Greek Art

London
Anastasia Orfanidou
+44 20 7468 8356

Golf Sporting Memorabilia

Edinburgh
Kevin McGimpsey
Hamish Wilson
+44 131 240 0916

Irish Art

London
Penny Day
+44 20 7468 8366

Impressionist & Modern Art

London
India Phillips
+44 20 7468 8328
New York
Caitlyn Pickens
+1 212 644 9135
Los Angeles
Kathy Wong
+1 323 436 5415

Indian, Himalayan & Southeast Asian Art

New York
Mark Rasmussen
+1 917 206 1688
Hong Kong
Edward Wilkinson
+852 2918 4321

Islamic & Indian Art

London
Oliver White
+44 20 7468 8303

Japanese Art

London
Suzannah Yip
+44 20 7468 8368
New York
Jeff Olson
+1 212 461 6516

Jewellery

London
Jean Ghika
+44 20 7468 8282
Emily Barber
+44 20 7468 8284
New York
Brett O'Connor
+1 212 461 6525
Caroline Morrissey
+1 212 644 9046
Camille Barbier
+1 212 644 9035
Los Angeles
Emily Waterfall
+1 323 436 5426
San Francisco
Shannon Beck
+1 415 503 3306
Hong Kong
Paul Redmayne
+852 3607 0006

Marine Art

London
Veronique Scorer
+44 20 7393 3962

Mechanical Music

London
Jon Baddeley
+44 20 7393 3872

**Modern & Contemporary
African Art**

London
Giles Peppiatt
+ 44 20 7468 8355
New York
Hayley Grundy
+1 917 206 1624

**Modern & Contemporary
Middle Eastern Art**

London
Nima Sagharchi
+44 20 7468 8342

**Modern & Contemporary
South Asian Art**

London
Tahmina Ghaffar
+44 207 468 8382

**Modern Decorative
Art + Design**

London
Mark Oliver
+44 20 7393 3856
New York
Benjamin Walker
+1 212 710 1306
Dan Tolson
+1 917 206 1611
Los Angeles
Jason Stein
+1 323 436 5466

Motor Cars

London
Tim Schofield
+44 20 7468 5804
New York
Rupert Banner
+1 212 461 6515
Eric Minoff
1 917 206 1630
Evan Ide
+1 917 340 4657
Los Angeles
Jakob Greisen
+1 415 503 3284
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