The 57th Transportation Company
Light Helicopter,
The 98th Transportation Detachment (CHFM),
and
The CH-21C Shawnee

A scrapbook prepared for the
June 1987 reunion at
Ft. Rucker, Alabama

Courtesy: Boeing Vertol Company

Foreword

This scrapbook tries to tell the CH-21 helicopter story and at the same time to wrap in at least a part of the 57th Transportation Company (Light Helicopter) and the 98th Transportation Detachment (CHFM) story.

The contents are limited by time and materials available and are, therefore, not a comprehensive account, but we know that the units were formed at Ft. Riley in mid 1957 with Maj Maurice C. Bone commanding the 57th and Lt Herman M. Orrell III commanding the 98th.

Exact dates are lost in the fog of time and the line of succession may not be exact but perhaps we can fill in the blanks later. It went something like this:

57th	
1957 — 1960	Maj Mo Bone
1960 — 1961	Maj Bob Dillard
1962	Maj Milt Cherne
1962 — 1963	Maj Darwin Beauchamp
1963 — 1964	Maj Pat Delavan

98th	
1957 — 1958	Cpt Dick Orrell
1958	Lt Roy Briggs
1958 — 1960	Cpt Larry Herman
1960 — 1961	Lt Don Youngpeter
1961 — 1962	Cpt Ken Klippel
1962 — ?	

The 57th became the 120th Assault Helicopter Company sometime during 1963 or 1964 but the 98th continued to support the 120th until the end of the Vietnam war, and may still be on the rolls somewhere.

The CH-21 story begins with first flight on 11 April 1952, but if you ever wondered how that design evolved, excerpts based on Frank Piasecki's "Story of Vertical Lift" lead off this scrapbook. By the time the Army's helicopter companies were forming, the CH-21 was being produced by the new Vertol Aircraft Corporation (1956) which then became Boeing Vertol in 1960. We pick up the 57th/98th story at Ft. Riley with a few items of 1957 memorabillia provided by Dick Orrell and then move on with the units to Ft. Lewis and Vietnam. The story becomes hazy in late 1962 until the 57th was redesignated and the CH-21s were replaced by Hueys in the 1964-65 timeframe.

The CH-21 tandem rotor configuration has now evolved into the modern CH-47D and the old army Workhorse has probably disappeared even from the boneyard at David-Monthan AFB. One Shawnee remains in Philadelphia and that story concludes this scrapbook.

"HELICOPTERS" - A GENEALOGY OF ROTARY WING DREAMS AND EVOLUTIONARY DEVELOPMENT CULMINATING IN THE PIASECKI CH-21 TANDEM ROTOR "SHAWNEE"

IT ALL STARTED IN THE 16th CENTURY WITH LEONARDO DA VINCI -- THIS IDEA OF THE "FLYING WINDMILL". THE VENETIAN ARTIST, SCIENTIST AND INVENTOR WAS THE MAN WHO FIRST SET FORTH THE PRINCIPLE OF A REVOLVING WING FLYING MACHINE, GETTING OPERATING POWER FROM PEDALS WORKED BY THE FLYER'S FEET. RECOGNIZED AS THE FATHER OF THE HELICOPTER, HE INTRODUCED THE DIRECT LIFT CONCEPT OF FLIGHT.

DA VINCI'S HELICOPTER DRAWINGS DEPICTED A SPIRAL WING ON A VERTICAL SHAFT EMBODYING THE BASIC PRINCIPLES OF THE PRESENT DAY HELICOPTER. THE TUSCAN WIZARD CLAIMED THAT AIR HAD SUBSTANCE (WE CALL IT DENSITY) AND THAT A SPIRAL WING DEVICE, IF TURNED AT SUFFICIENTLY HIGH SPEED WOULD BORE INTO THE AIR MUCH AS AN AUGER BORES INTO WOOD. THESE THOUGHTS ORIGINATED BACK IN THE EARLY 16th CENTURY AND DA VINCI EVEN USED THE GREEK WORDS "HELI" MEANING SPIRAL OR TWIST AND "PTERON" MEANING WING IN REFERENCE TO HIS DREAM MACHINE.

AFTER DA VINCI, MANY OTHER MEN CREATED UNUSUAL AND WEIRD CONTRAPTIONS USING THE HELICOPTER IDEA WHICH EMPLOYED ONE OR MORE POWER DRIVEN HORIZONTAL AIR SCREWS OR ROTORS FROM WHICH THE MACHINE DERIVED ITS LIFT AND PROPULSION.

IN 1784 TWO FRENCH ARTISANS, LAUNOY AND BIENVENU, DEVISED AN INGENIOUS TOY CONSISTING OF TWO PROPELLERS MADE FROM TURKEY FEATHERS FIXED TO THE TIPS OF A SHAFT AROUND WHICH TWO SPRINGS WERE TWISTED. THE SPRINGS CAUSED THE FEATHERS TO ROTATE FOR A FEW SECONDS SUFFICIENT TO SEND THE TOY SPINNING MERRILY.

VERTICAL AIRLIFT BECAME A REALITY IN 1783 WITH A HOT AIR BALLOON ASCENT MADE BY THE MONGOLFIER BROTHERS OF FRANCE. ONE HUNDRED AND TWENTY YEARS WERE TO PASS BEFORE THE WRIGHT BROTHERS FLEW THE WORLD'S FIRST SUCCESSFUL POWERED AIRPLANE AT KITTY HAWK, NORTH CAROLINA. FOUR YEARS LATER, LOUIS BREGUET OF PARIS BUILT THE FIRST MAN-CARRYING HELICOPTER.

WORLD WAR I, AND THE INTENSE INTEREST IN THE AIRPLANE AS A WEAPON, DELAYED THE EARLY HELICOPTER'S DEVELOPMENT. AFTER THE WAR, THE "AUTOGYRO" WAS INVENTED BY DE LA CIERVA (SPAIN). CIERVA SOLVED THE PROBLEM OF ROLL STABILITY IN SINGLE ENGINE ROTORCRAFT BY MAKING THE ROTARY WINGS FLEXIBLE. HE PUT HINGES ON THE BLADES OF HIS NEXT AUTOGYRO WHICH TOOK TO THE AIR WITHOUT A HITCH. THANKS TO CIERVA'S BRILLIANT EXPERIMENTS, THE TRUE WHIRLYBIRD'S INVENTORS HAD A MUCH EASIER TIME. PITCAIRN (USA), KELLETT (USA), THE AUTOGYRO COMPANY OF GREAT BRITAIN, AND FOCKE (GERMANY) PRODUCED VARIATIONS OF THIS AIRCRAFT. ITS UNPOWERED, WIND-TURNED ROTOR MADE THE AUTOGYRO CAPABLE OF SLOW FLIGHT, FREE OF STALLING, BUT WITHOUT THE CAPABILITY OF HOVERING.

THE HELICOPTER, WITH A POWERED ROTOR, PROMISED HOVERING BUT HAD GREATER TECHNICAL PROBLEMS. THESE EARLY MACHINES WERE NOT DEVELOPED TO THE POINT OF PRACTICAL USE. MANY EXPERTS, INCLUDING THE WRIGHT BROTHERS, DEEMED THE HELICOPTER TOO COMPLICATED. DESPITE THE SKEPTICISM USUALLY MET BY ANY NEW IDEA, A HANDFUL OF DESIGNERS WERE DETERMINED TO MAKE VTOL (VERTICAL TAKEOFF OR LANDING) TECHNOLOGY WORK.

BREGUET SUCCESSFULLY FLEW HIS SECOND HELICOPTER (TWO CO-AXIAL ROTORS) OVER A 9 KM CLOSED COURSE. DE BOTHEZAT'S (RUSSIA/USA) FOUR ROTOR HELICOPTER FLEW IN 1922 BUT THE PILOT DECLARED IT DEFICIENT IN CONTROL. BERLINER, FLETTNER, HAFNER, YOUNG, FOCKE, WILFORD, DALAND, LEPAGE, DOBLHOFF AND OTHERS DEVELOPED VARIOUS METHODS OF CONTROLLING VTOL. IN 1939 IGOR SIKORSKY FLEW THE FIRST SUCCESSFUL HELICOPTER IN THE UNITED STATES, HIS VS-300.

IN 1936, FRANK N. PIASECKI AND A GROUP OF ENGINEERING STUDENTS FROM THE UNIVERSITY OF PENNSYLVANIA FORMED THE P-V ENGINEERING FORUM TO DESIGN AND BUILD THEIR OWN HELICOPTER.

THE FOLLOWING IS A SHORT PICTORIAL STORY OF THE EFFORTS AND ACCOMPLISHMENTS OF THE PIASECKI TEAM, THE VERTICAL AIRLIFT TECHNOLOGY THEY FORMULATED, AND THE AIRCRAFT THEY DESIGNED, PRODUCED AND SUCCESSFULLY FLEW DURING FORTY YEARS OF INNOVATIVE RESEARCH.

This section courtesy of the Piasecki Aircraft Corporation

"THE PIASECKI STORY OF VERTICAL LIFT"

THE ACHIEVEMENTS WHICH MARK PIASECKI VERTICAL LIFT AIRCRAFT DESIGNS ARE PRESENTED FOR YOUR INTEREST AND AS A TRIBUTE TO THOSE WHO MADE THESE ACCOMPLISHMENTS POSSIBLE.

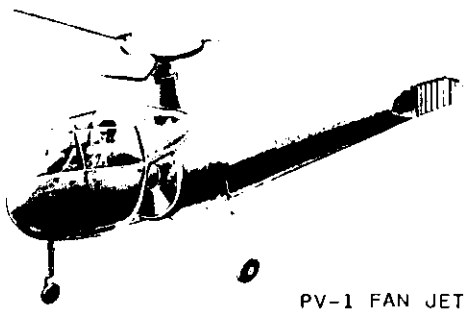
MAY THE COMING YEARS BE AS FRUITFUL AS THE PAST FORTY-THREE.

Let's Go! F. N. PIASECKI

Piasecki HELICOPTER CORPORATION

PV-2 TENTH ANNIVERSARY - 1953 - MORTON, PA.
KEN MEENEN, ELLIOT DALAND, F.N. PIASECKI, DON MEYERS, FRANK MAHROL, WALT SWARTZ

THE FORUM'S FIRST DESIGN, THE PV-1, WAS TO DEMONSTRATE NEW ROTOR IDEAS AND A UNIQUE ANTI-TORQUE SYSTEM WITH A FAN BLOWING AIR THROUGH THE TAIL CONE, TURNED BY CONTROL VANES IN THE EXIT.



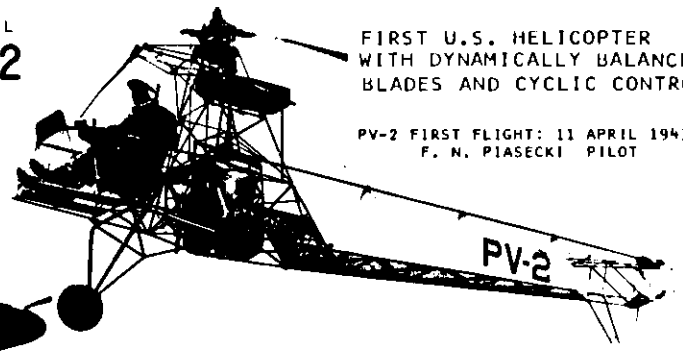
PV-1 FAN JET TAIL REACTOR, 1940

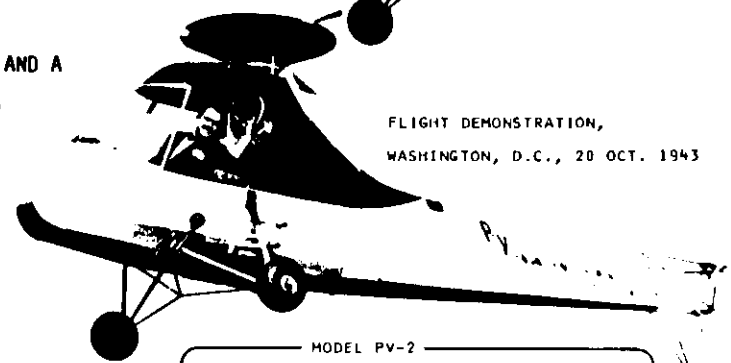
HOWEVER, TO MINIMIZE DEVELOPMENT RISKS, A CONVENTIONAL TAIL-ROTOR WAS CHOSEN FOR ANTI-TORQUE AND YAW CONTROL. THIS MACHINE, THE PV-2, A SINGLE SEAT, SINGLE ROTOR HELICOPTER, WAS BUILT AS A TECHNOLOGY DEMONSTRATOR OF SEVERAL ADVANCED CONCEPTS IN THE HERETOFORE UNDEVELOPED VTOL FIELD. THE MACHINE FEATURED THE FIRST DYNAMICALLY BALANCED ROTOR BLADES, A RIGID TAIL ROTOR WITH A TENSION-TORSION PITCH CHANGE SYSTEM, AND FULL CYCLIC AND COLLECTIVE ROTOR PITCH CONTROLS. FRANK PIASECKI, WHO TAUGHT HIMSELF TO FLY THE PV-2 HELICOPTER WITH ONLY 14 HOURS OF PREVIOUS FIXED WING TIME, WAS THE TEST PILOT ON THE FIRST FLIGHT ON 11 APRIL 1943. ON 20 OCTOBER 1943, HE DEMONSTRATED THE MACHINE'S PRECISE FINGER-TIP CONTROL CHARACTERISTICS BEFORE MILITARY AND COMMERCIAL OPERATORS IN WASHINGTON, D.C. IT WAS THE SECOND SUCCESSFUL HELICOPTER TO FLY IN THE U.S. AND IS NOW DISPLAYED AT THE SMITHSONIAN AIR AND SPACE MUSEUM IN WASHINGTON, D.C.

MODEL
PV-2

FIRST U.S. HELICOPTER WITH DYNAMICALLY BALANCED BLADES AND CYCLIC CONTROL

PV-2 FIRST FLIGHT: 11 APRIL 1943
F. N. PIASECKI PILOT





FLIGHT DEMONSTRATION,
WASHINGTON, D.C., 20 OCT. 1943

MODEL PV-2

TYPE	SINGLE PLACE HELICOPTER
ENGINE	FRANKLIN 4 CYL. AIRCOOLED
H.P.	90
ROTOR DIAMETER	25 FT.
FUSELAGE LENGTH	21.5 FT.
GROSS WEIGHT	1,000 LB.
MAX. SPEED	100 MPH
CRUISING SPEED	80 MPH
RANGE	150 MILES

F. N. PIASECKI &
E. DALAND - 1943

MODEL
XHRP-X

DURING WORLD WAR II THE COAST GUARD HAD AN URGENT NEED FOR AT-SEA RESCUE OF TORPEDOED SHIPPING CREWS ALONG THE U.S. EAST COAST.

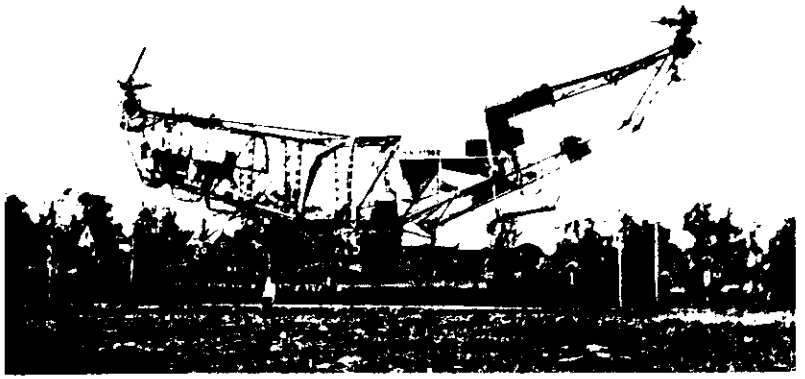
THERE WAS MUCH SKEPTICISM IN THE NAVY ABOUT HELICOPTERS. THEIR EXPERIENCE WITH AUTOGYROS SHOWED WEIGHT EMPTY PERCENTAGE OF GROSS WEIGHT RAPIDLY INCREASED AS THE ROTOR SIZE INCREASED. THEREFORE, IT WAS FELT THAT NO HELICOPTER COULD BE DESIGNED TO MEET THE NAVY'S 1800 POUNDS USEFUL LOAD REQUIREMENT.

PIASECKI PROPOSED A TANDEM ROTOR CONFIGURATION TO BEST MEET THE DESIGN CRITERIA OF THIS INCREASED SIZE HELICOPTER, WHICH WAS THREE TIMES LARGER THAN ANY YET FLYING. TWO ROTORS PERMITTED A LOW DISK LOADING, YET ALLOWED THE BLADE SPARS TO BE WITHIN AVAILABLE MATERIAL LENGTH. THE TANDEM DESIGN PROVIDED A SIGNIFICANT INCREASE IN CENTER OF GRAVITY TRAVEL, THUS NEGATING THE NEED FOR SHIFTING BALLAST AS WAS NECESSARY THEN IN THE SINGLE ROTOR HELICOPTERS.

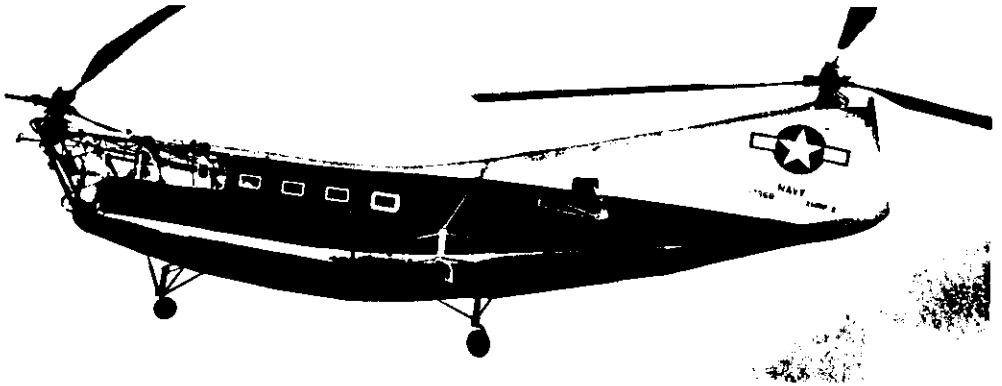
THE COAST GUARD, NOW CONVINCED, TOOK THE LEAD AND A CONTRACT WAS SIGNED ON NEW YEAR'S DAY 1944 FOR THE XHRP-1 (EXPERIMENTAL HELICOPTER, TRANSPORT, PIASECKI, MODEL ONE).

FOURTEEN MONTHS LATER, PIASECKI PILOTED THE WORLD'S FIRST SUCCESSFUL TANDEM HELICOPTER. THIS FIRST TANDEM WAS CALLED THE "DOGSHIP" BECAUSE IT WAS A FLYING MOCKUP, AND WAS FLOWN AS A CONTROL DEMONSTRATOR, WITHOUT ITS FABRIC COVER. SINCE A TAIL ROTOR WAS NOT NEEDED TO COUNTER THE MAIN ROTOR TORQUE, MORE WEIGHT COULD BE LIFTED WITH A GIVEN ENGINE. IT CARRIED 10 MEN AND REACHED A FORWARD SPEED OF 90 MILES PER HOUR.

CRITICS PREDICTED THAT DOWNWASH FROM THE FRONT ROTOR IN FORWARD FLIGHT WOULD CAUSE SEVERE REAR ROTOR TURBULENCE, SPOILING ITS CONTROL CAPABILITY. THIS NEVER HAPPENED WHEN THE PROPER DIFFERENTIAL COLLECTIVE PITCH WAS ADDED TO THE LONGITUDINAL CONTROL.



"DOGSHIP", FIRST FLIGHT: 7 MARCH 1945
F.N. PIASECKI, PILOT - G. TOWNSON, COPILOT



"DOGSHIP" IN COVERED FORM

MODEL XHRP-X

MISSION	TRANSPORT
CREW	2
PASSENGERS	10
ENGINE	CONTINENTAL R-975
H.P.	450
ROTOR DIAMETER	41 FT.
FUSELAGE LENGTH	48 FT.
USEFUL LOAD	2,000 LB.
MAX. SPEED	110 MPH
CRUISING SPEED	100 MPH
RANGE	300 MILES

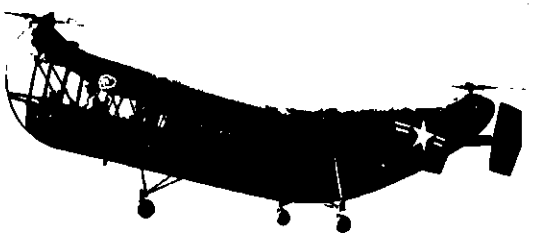
MODEL HRP-1

WORLD'S FIRST TRANSPORT
HELICOPTER IN PRODUCTION

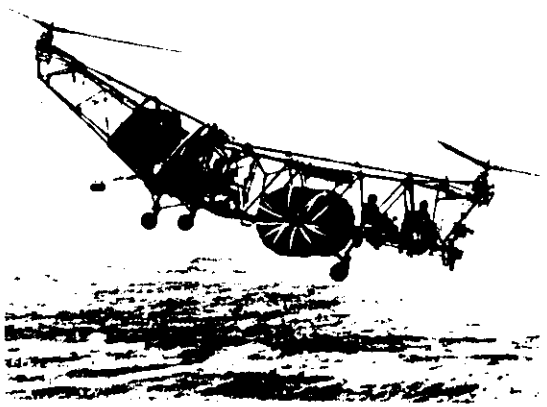
THE CONCEPT OF A FLYING MOCKUP PERMITTED A RAPID DEMONSTRATION OF THE UNIQUE TANDEM CONFIGURATION WHILE MEASUREMENTS OF THE XHRP-X FLIGHT AND CONTROL CHARACTERISTICS RESULTED IN EARLY DESIGN IMPROVEMENTS AND THE XHRP-1 PROTOTYPE.

TWENTY PRODUCTION HRP-1's WERE DELIVERED TO THE NAVY AND COAST GUARD. THEY WERE NICKNAMED THE "FLYING BANANA" BECAUSE OF THE CURVE IN THE FUSELAGE THAT PROVIDED ROTOR BLADE CLEARANCE. THE HRP'S WERE FOUND TO BE PRACTICAL IN MANY PIONEERING APPLICATIONS THAT TODAY ARE STANDARD IN THE MILITARY INCLUDING SEARCH AND RESCUE, ANTI-SUBMARINE WARFARE, AMPHIBIOUS ASSAULT, HEAVY TRANSPORT, AND MINESWEEPING.

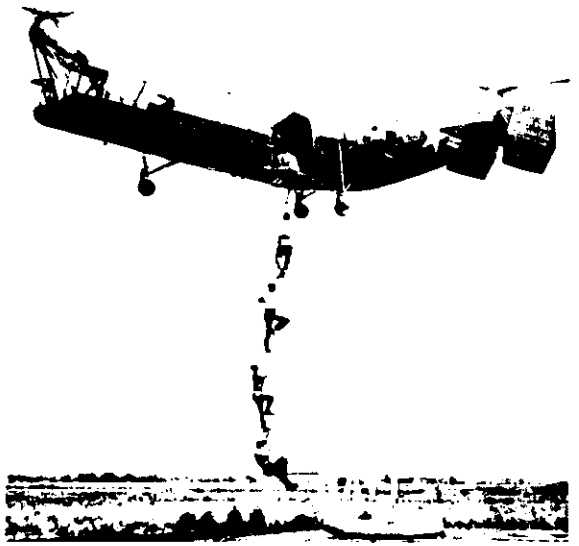
TWELVE HRP-1'S WERE ASSIGNED TO THE MARINE CORPS TO HELP DEVELOP VERTICAL ASSAULT TACTICS DURING OPERATIONS FROM THE LIGHT CARRIER "SAIPAN" AND ESCORT CARRIER "PALAU". NAVY SQUADRONS FLEW THE HRP-1 UNTIL 1953, PRIMARILY IN THE DEVELOPMENT OF ANTI-SUBMARINE WARFARE EQUIPMENT AND MINESWEEPING EXPERIMENTS.



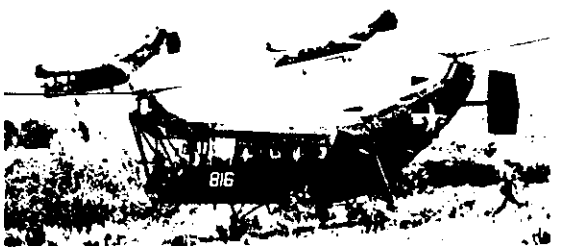
XHRP-1 FIRST FLIGHT: 3 NOVEMBER 1947
W. KNAPP, PILOT



EARLY MINESWEEPING TESTS OFF PANAMA CITY, FLA. 1952
NOTE CABLE BEING TOWED



DEMONSTRATION OF LADDER TECHNIQUE AT INAUGURATION OF IDLEWILD AIRPORT, AUGUST 1948



MARINES TEST NEW ASSAULT TACTICS

MODEL HRP-1

MISSION	TRANSPORT, CRANE, TOW, ASW
CREW	2
PASSENGERS	10
ENGINE	P & W R-1340
H.P.	600
ROTOR DIAMETER	41 FT.
FUSELAGE LENGTH	48 FT.
WEIGHT EMPTY	5,041 LB.
USEFUL LOAD	1,859 LB.
MAX. SPEED	103 MPH
CRUISING SPEED	86 MPH
RANGE	265 MILES
CEILING WITH NORMAL LOAD	10,400 FT.

MODELS

XHJP-1 HUP-1/2/3/4 H-25

IN 1945, THE NAVY ISSUED REQUIREMENTS FOR A COMPACT UTILITY/RESCUE HELICOPTER TO OPERATE FROM AIRCRAFT CARRIERS, BATTLESHIPS, AND CRUISERS. INDUSTRY-WIDE COMPETITION WAS HELD BY THE U.S. NAVY AND THE PIASECKI XHJP-1 WON OVER THE SIKORSKY XHJS-1 AND BECAME THE PRODUCTION HUP-1.

SHIPBOARD REQUIREMENTS, PARTICULARLY THE SMALL CARRIER ELEVATOR, PRESENTED A DIFFICULT ROTOR FOLDING PROBLEM TO ALLOW RAPID STORAGE BELOW DECK. THIS OVERLAPPED ROTOR CONFIGURATION DESIGNED BY PIASECKI WAS IDEALLY SUITED TO FIT THESE ELEVATORS BY PLACING THE BLADE TIPS OF THE TWO 3-BLADED ROTORS IN EACH CORNER. BLADE FOLDING WAS NOT REQUIRED FOR CARRIERS, THUS EXPEDITING MOVEMENT TO THE HANGAR DECK BELOW. THE BLADES WERE FOLDABLE FOR THE SMALLER CRUISER ELEVATORS, MAKING IT THE MOST COMPACT HELICOPTER FOR ITS WEIGHT. THIS WAS THE FIRST OVERLAPPING ROTOR TANDEM HELICOPTER TO FLY.

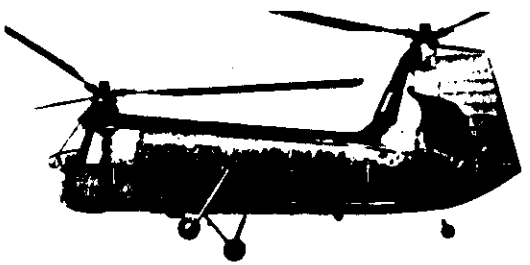
THE HUP WAS A SIX-PLACE, SINGLE ENGINE HELICOPTER WITH AN ALL-METAL, SEMI-MONOCOQUE FUSELAGE AND FIXED CONVENTIONAL LANDING GEAR. FOR EASE OF MAINTENANCE, THE ENGINE AND ITS MOUNT, FAN, COWLING, OIL SYSTEM, ACCESSORIES, etc., WAS REMOVABLE AS ONE UNIT THROUGH AN OVERHEAD HATCH IN THE REAR FUSELAGE. THE HUP-2 WAS THE FIRST PRODUCTION HELICOPTER TO BE EQUIPPED WITH AN AUTOPILOT WHICH PERMITTED IFR AND HANDS-OFF FLYING, INCLUDING HOVERING.

THE RUGGED HUP WAS BUILT TO HIGHER LOAD FACTORS THAN PREVIOUS HELICOPTERS AND WAS THE FIRST HELICOPTER TO PERFORM A LOOP, UNINTENTIONALLY, WHEN DEMONSTRATING ITS "G" CAPABILITIES. MISSIONS OF THE HUP WERE SHIPBASED RESCUE, OBSERVATION AND UTILITY, PERSONNEL AND CARGO TRANSPORT. A TOTAL OF 339 HUP-1/2/3 AND THE ARMY VERSION, THE H-25, "ARMY MULE" HELICOPTERS WERE DELIVERED TO THE UNITED STATES ARMY AND NAVY, THE ROYAL CANADIAN NAVY, AND THE FRENCH NAVY. OVER THEIR 20-YEAR LIFE, THESE HELICOPTERS WERE RESPONSIBLE FOR THE SAVING OF MANY LIVES.

"RETRIEVER" FOR THE FLEET

FIRST SUCCESSFUL AUTOMATIC PILOT
INSTALLATION IN HELICOPTER
SEPTEMBER 1950

W. COFFEE, PILOT - A. BOTT, COPILOT



XHJP-1 FIRST FLIGHT: OCTOBER 1948
W. KNAPP, PILOT

MODEL HUP-2 (H-25)

MISSION	RESCUE & UTILITY
CREW	2
PASSENGERS	4
ENGINE	CONTINENTAL R975-42
H.P.	550
ROTOR DIAMETER	35 FT.
FUSELAGE LENGTH	32 FT.
WEIGHT EMPTY	4,100 LB.
USEFUL LOAD	1,650 LB.
MAX. SPEED	108 MPH
CRUISING SPEED	84 MPH
RANGE	360 MILES
CEILING WITH NORMAL LOAD	10,200 FT.

HOISTING JOHN GLENN FROM USS NOA
PICK-UP DESTROYER, FEBRUARY 1962

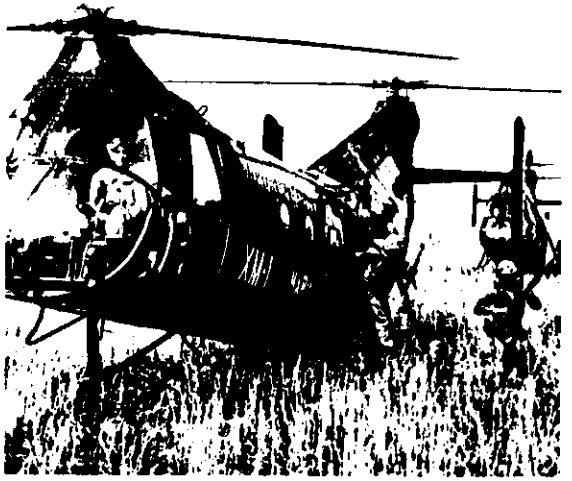
MODEL
HRP-2

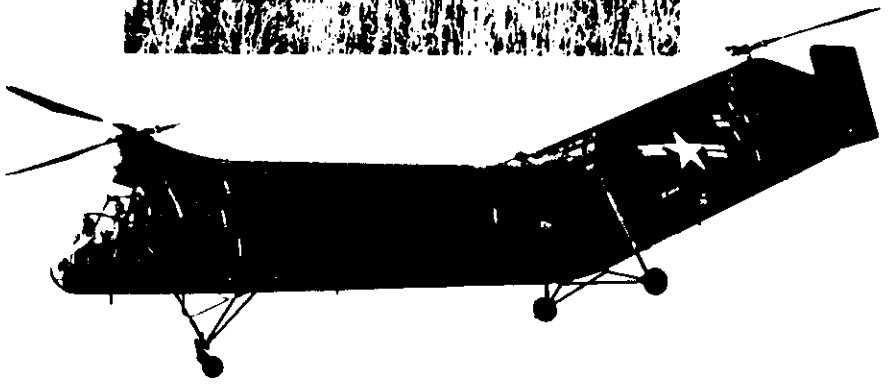
REVOLUTIONARY "VERTICAL ENVELOPMENT" TACTICS DEVELOPED

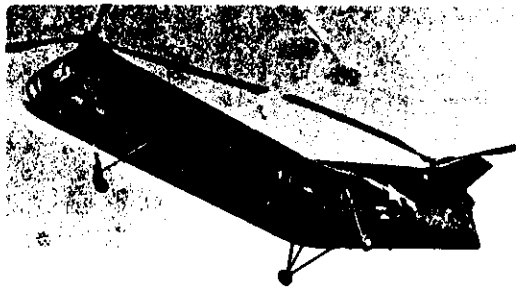
THE HRP-2, AN IMPROVED VERSION OF THE HRP-1 "RESCUER", WITH AN AERODYNAMICALLY STREAMLINED ALL-METAL FUSELAGE, WAS DEVELOPED FOR THE ASSAULT MISSION OF THE U.S. MARINE CORPS. IN THE EARLIER TANDEMS THE LONG DISTANCE FROM THE COCKPIT TO THE LANDING GEAR AND CENTER OF GRAVITY CAUSED SOME CONCERN FROM A PILOTING STANDPOINT. THUS, THE ORIGINAL XHRP-X LANDING GEAR WAS DESIGNED WITH CASTERING WHEELS TO AVOID SKIDDING THE TIRES OFF IN CASE LATERAL MOTION WAS UNDETECTED BY THE PILOT. FLIGHT EXPERIENCE, HOWEVER, SHOWED THE PILOT COULD HOLD THE WHEELS MOTIONLESS FOR A VERTICAL LANDING. THE CASTER FEATURE WAS ELIMINATED FROM THE HRP-2 LANDING GEAR WHICH MADE THE AIRCRAFT MORE STABLE ABOARD SHIP.

THE PILOT POSITION IN THE HRP-1 TANDEM WAS KEPT CLOSE TO THE CENTER OF GRAVITY BECAUSE THE CENTER OF A HOVER TURN WAS NOT PREDICTABLE AND IF THE CG WERE AT THE CENTER OF GRAVITY THE PILOT WOULD BE AT THE END OF A LARGE TURNING RADIUS. THIS RESULTED IN REDUCED VISIBILITY FOR THE PILOT WHILE SEATED BEHIND THE FORWARD ROTOR. HOWEVER, FROM THE FLIGHT EXPERIENCE OF THE HRP-1, PILOTS ALWAYS TURNED ABOUT THEIR OWN CENTER UNLESS IT WAS NECESSARY TO KEEP THE CG OF THE HELICOPTER IN A FIXED POSITION RELATIVE TO THE GROUND AS IN A LOG LIFT. THEREFORE, THE HRP-2 COCKPIT WAS PUT FORWARD OF THE FRONT ROTORS WITH A SIDE-BY-SIDE SEATING ARRANGEMENT FOR BETTER VISIBILITY AND PILOT-COPILOT COORDINATION.

THE LIGHT STRUCTURE RELATIVE TO SIMILARLY LOADED AIRPLANE FUSELAGES REQUIRED THINNER SKIN AND STIFFENED SECTIONS TO KEEP THE WEIGHT DOWN. A STRETCH MILLING PROCESS DEVELOPED BY PIASECKI TO MAKE THESE PARTS IS NOW COMMON PRACTICE THROUGHOUT THE INDUSTRY.







HRP-2 FIRST FLIGHT: 10 NOVEMBER 1949
J. RYAN, PILOT - F.N. PIASECKI, COPILOT

MODEL HRP-2

MISSION	RESCUE & TRANSPORT
CREW	2
PASSENGERS	10
ENGINE	P & W R-1340
H.P.	600
ROTOR DIAMETER	41 FT.
FUSELAGE LENGTH	54 FT.
WEIGHT EMPTY	5,301 LB.
USEFUL LOAD	1,924 LB.
MAX. SPEED	109 MPH
CRUISING SPEED	92 MPH
RANGE	350 MILES
CEILING WITH NORMAL LOAD	9,840 FT.

MODEL

H-21

"WORKHORSE" FOR
THE SERVICES

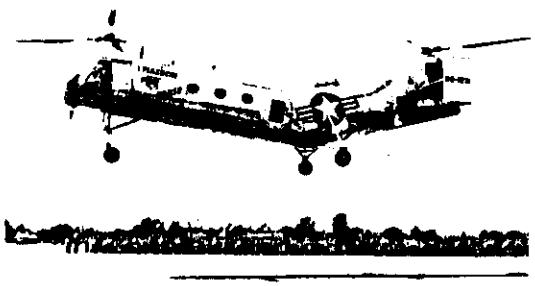
THE H-21 USED THE SAME BASIC CONFIGURATION AS THE HRP-2. THE 41 FOOT ROTOR WAS INCREASED TO 44 FEET, AND A 1,425 HORSEPOWER ENGINE INSTALLED, INCREASING THE GROSS WEIGHT FROM 7,225 TO 14,700 LBS. THE H-21A WAS THE WINNER OF AN AIR FORCE DESIGN COMPETITION, DESIGNED AS A HIGH ALTITUDE ARTIC RESCUE HELICOPTER FOR FOURTEEN TROOPS OR TWELVE STRETCHERS. LATER VERSIONS (H-21B/C) WERE DEVELOPED TO LIFT 20 TROOPS. THE H-21 HAD A FIXED TRI-CYCLE LANDING GEAR WITH AN ALL TERRAIN ALIGHTING CAP-ABILITY USING DOUGHNUT SHAPED FLOATS FITTED AROUND THE WHEELS. TWIN VERTICAL FINS WERE FITTED AT THE TAIL. SEVERAL H-21D'S HAD TWO T-58 TURBOSHAFT ENGINES IN-STALLED, MARRIED TO A COMMON TRANSFER CASE.

THE H-21 BECAME THE FRENCH ARMY'S PRIME WORKHORSE THROUGHOUT THE ALGERIAN WAR, PIONEERING TROOP AIR ASSAULT TACTICS AND A FORWARD AIR SUPPLY SYSTEM. THE FIRST HELICOPTERS TO USE .50 CALIBER MACHINE GUNS IN COMBAT WERE THE H-21'S IN ALGERIA. LATER, IT WAS UTILIZED IN A SIMILAR MANNER BY THE U.S. ARMY IN THE EARLY STAGES OF THE VIETNAM WAR.

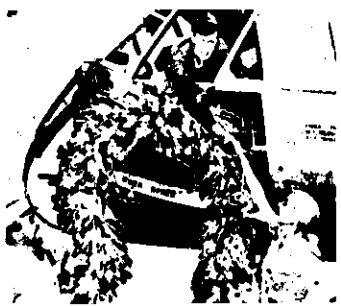
IN 1953, THE U.S. AIR FORCE SET TWO WORLD RECORDS IN THE H-21; 146.7 MPH SPEED AND 22,110 FEET ALTITUDE. ON 24 AUG. 1956, A U.S. ARMY H-21 MADE THE FIRST NON-STOP TRANSCONTINENTAL HELICOPTER FLIGHT ACROSS THE UNITED STATES WITH IN-FLIGHT REFUELING IN 37 HOURS.

PRODUCTION OF THE H-21 TOTALLED 707 FOR U.S. SER-VICES INCLUDING 150 FOR USE IN WEST GERMANY, CANADA, FRANCE, SWEDEN, JAPAN AND OTHER FOREIGN COUNTRIES.

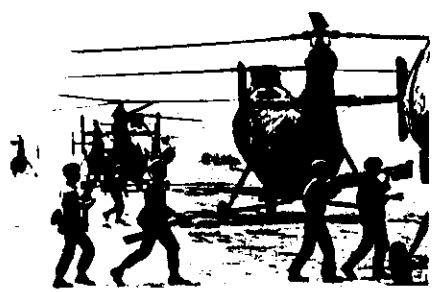
OVER 30 YEARS LATER, SOME OF THESE AIRCRAFT ARE STILL IN SERVICE.

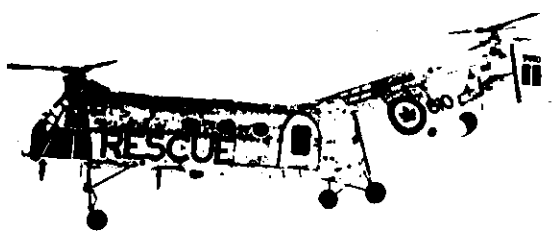


H-21 FIRST FLIGHT: 11 APRIL 1952
L. LAVASSAR, PILOT - H. JOHNSON, COPILOT



H-21 PILOT RUSSELL DOBYNS, USAF, AFTER SETTING NEW WORLD'S RECORDS FOR SPEED (146.735 MPH) AND ALTITUDE (22,110 FT.) F.N. PIASECKI AND ACTRESS ELYCE KNOX MAKE PRESENTATION 1953





ONE OF THE H-21'S USED BY R.C.A.F. IN SUPPORT OF MID-CANADA RADAR LINE

MODEL H-21

MISSION	TRANSPORT & RESCUE
CREW	2
PASSENGERS	20 OR 12 LITTERS
ENGINE	WRIGHT R-1820
H.P.	1425
ROTOR DIAMETER	44 FT
FUSELAGE LENGTH	52.6 FT.
WEIGHT EMPTY	9,148 LB.
USEFUL LOAD	5,556 LB.
MAX. SPEED	125 MPH
CRUISING SPEED	101 MPH
RANGE	400 MILES
CEILING WITH NORMAL LOAD	7,750 FT.

The H-21A was the winner of an Air Force design competition, designed as a high altitude arctic rescue helicopter for 14 troops or 12 stretchers. Later versions (H-21B/C) were developed to lift 20 troops. The H-21 used the same basic configuration as the HRP-2 but with the rotor diameter increased to 44 feet and a 1,425 horsepower engine installed increasing the gross weight from 7,225 to 14,700 pounds, useful load was 4,700 pounds, range 300 miles max forward speed = 120 mph and service ceiling = 10,000 feet. The H-21 had a fixed tri-cycle landing gear with an all terrain alighting capability using doughnut shaped floats fitted around the wheels and twin vertical fins were fitted at the tail.

In 1957, Vertol installed two General Electric T-58 gas turbines in an H-21 helicopter and designated it, YH-21D. Production of the H-21 and its A, B, and C variants eventually totalled 707 machines for the U.S. services with 150 of these going to the air arms of foreign countries such as West Germany, Canada, Sweden, France, etc. The Piasecki H-21 Shawnee was destined to go to war and serve with honor in Korea, Algeria and Vietnam.

In 1955, Frank Piasecki and members of his original team left Piasecki Helicopter Corporation and started the Piasecki Aircraft Corporation (PIAC) to work on new VTOL aircraft concepts.

The Piasecki Helicopter Company became the Vertol Aircraft Corporation in 1956 and, while continuing to support the H-21 product line, Vertol concentration was on the 107 prototype, a twin turbine, tandem rotor helicopter which became the CH-47 Chinook for the U.S. Army. First flight was in 1961.

The H-21 Service Record

- This unique tandem rotor helicopter, fondly known as the "Flying Banana," "Workhorse" or "Shawnee," dependent upon ownership, enjoyed a long and varied career while carrying the colors of the U.S. Army, U.S. Air Force and a host of foreign fighting forces.
- Production of the venerable H-21 for U.S. services eventually totalled 707 deliveries, of which approximately 150 were for use by foreign governments such as Canada, France, West Germany, etc. The U.S. Army started to receive their H-21s in August 1954. The most H-21s ever carried on the U.S. Army inventory was 308 in Dec 1958. On 31 Jan 1962, the U.S. Army carried 16 H-21Bs and 288 H-21Cs for a respectable 304 total aircraft.

Some auspicious U.S. Army units to operate the H-21s were:

57th Trans Co. (Light Hel)	First U.S. Army aviation units
8th Trans Co. (Light Hel)	zone
93rd Trans Co. (Light Hel)	deployed to the South RVN combat
6th Trans Co. (Light Hel)	Served in Korea — post war duty
13th Trans Co. (Light Hel)	Served in Korea — post war duty
3rd Trans Co. (Light Hel)	Based at Ft. Belvoir, Virginia
153rd Trans Co. (Light Hel)	Based at Ft. Belvoir, Virginia
80th Trans Co. (Light Hel)	3,550-mile ferry when deployed from Ft. Riley, Kansas to Ft. Richardson, Alaska

The H-21 in Foreign Service

France

The 108 H-21s delivered to France became the French Army's prime "workhorse" throughout the Algerian War in North Africa while pioneering troop air assault tactics and a forward air supply system.

Canada

Royal Canadian Air Force procured 6 CH-21A models in Aug-Sept 1954 through the U.S. Air Force and a later buy of 9 CH-21B models in November 1955-May 1956. These aircraft were used primarily for logistics support to the far flung northern reaches of the distant early warning (DEW) line. Ten additional aircraft, models H-21B and H-21C, were converted by Boeing of Canada to the commercial V42 configuration and sold to a Canadian commercial helo company — "Rick Helicopters."

West Germany

Tapped the till for 26 each Vertol 43 and V44A models, a utility version of the H-21C. These were used by the Herrensflieger for troop transport and logistic resupply. Deliveries commenced in March 1957 and were completed one year later.

Burma

Everybody got into the act — the Burmese Air Force received 6 each V44As (utility version of the H-21C) from the USAF under the military assistance program (MAP) with deliveries made in Dec 1958. The aircraft were based at Mingaladon Airport, Rangoon, for use in putting down the rebel insurgents.

Sweden

From Feb 1958 thru July 1959, the USAF transferred 6 V44As to the Swedish Air Force also via the MAP.

USSR

Now this one is hard to believe but even the Soviet Union wanted in on the H-21 and although two were ordered, they actually took delivery on one —a Boeing Vertol V44C in Oct 1960. It was ostensibly to be used as an executive transport.

Although not serving in military livery, there are, at this date, H-21s airworthy and operating in several areas of the mid and far west, as well as Alaska — over 30 years after seeing the first light of day at the Piasecki Company, Morton, Pennsylvania.

SHAWNEE

MISSION CATEGORY
UTILITY TACTICAL
TRANSPORT HELICOPTER

	NEW	OLD
DESIGNATION	CH-21	H-21

Algeria (1956-1960)

— Up until this time the limiting factors in the use of helicopters as tactical vehicles in the war arenas of Korea and Malaysia were restricted payloads and range capabilities.

— In the few intervening years helicopters such as the H-34 and the H-21 with substantially increased lift capabilities of 12 to 16 passengers or 1½ metric tons (3,300 pounds) became available and were pressed into service.

— Although the land surface was mostly desert (70% being less than 2,000 ft. above sea level), most helicopter activity took place in the northeastern sector encompassing the Atlas and Aures Mountains ranging 3,000 to 7,000 feet in altitude.

— The enemy threat without advanced weaponry and transport was carried out in 3 ways:

1 — Terrorist activity in cities and suburbs

2 — Rebel bands operating in the mountainous areas for the purpose of ambushing convoys, destroying rails and bridges and disrupting communication lines

3 — Movement of arms and material into Algeria from Tunisia and the sea

By Government decree, the French Army was committed to a limited response against this threat. All combat was defensive or reactive against identified units or against rebel forces already on the attack. The H-21 helicopters were used in support of operations against those rebel bands and arms flow with the objective of providing quick reaction and early response.

— There was a sharp difference in philosophy between French Army and Air force operational techniques:

Time delays associated with the centralized control concept used by the French Air Force greatly reduced the effectiveness of the airmobile operations in western Algeria. All control and operation of aircraft was conducted from a main air base near Algiers which was quite a distance from the area of action.

Conversely the decentralized concept of control used by the Army resulted in the creation of separate Helicopter Intervention Detachments (HID), each consisting of two H-13s or Alouette IIs and six H-21 helicopters, the latter used primarly for transport of troops, equipment and supplies.

The H-21s in the Army operational area became a routine means of transport for Army airmobile assaulting forces. This was well expressed by the Commander of the 2nd Regiment, French Foreign Legion troops who said, "Tanks, aviation and artillery are nothing but means of support, whereas in North Africa, the helicopter represents the maneuver itself."

— In Algeria weapon installations on helicopters for suppressive fire moved from the developmental to the combat useful stage.

Both machine guns and rockets were mounted on the H-21s. These "armed helicopters" were used basically to saturate the landing zone immediately prior to the landing of the troop-carrying H-21s. Thus the creation of the "gun ship" was necessitated by the limited payload of the troop-carrying H-21s which precluded both armament and troops.

Even at this early stage of the war it was recognized that the 7.62 machine gun was too light to be truly a threat against an enemy well dug in or in heavy foliage or protected areas. A French Naval Officer devised a most effective 20mm cannon installation mounted in the cabin door entrance of the H-21s assigned to him. This gave him a stand-off advantage in neutralizing hostile ground fire.

This lesson had to be relearned in Vietnam after several years of experience with lighter weapons.

Conclusions

— An evaluation of the use of the helicopter in Algeria leads one to the conclusion that a more complete realization of the "airmobile" concept could have been achieved except:

— Interservice differences of opinion as to assignment and organization of helicopter units had the effect of dividing the fleet thus reducing quantities of aircraft available at any one time. This division of opinion and tactics permitted the testing of both French concepts and many helicopter units later operating in Vietnam were positioned for "quick response" on much the same basis as French Army operations.

— The limited load-carrying ability of the H-34 and the H-21 helicopters under the difficult temperature/altitude conditions encountered in Algeria was frequently insufficient to transport tactical unit loads. The desire to transport a fully equipped 13-man fire team (Squad) in each H-21 in order to retain tactical integrity could not always be met.

— As capable and dependable as the versatile H-21 "Workhorse" was in this combat environment, the need for larger and more powerful and efficient helicopters once again became obvious.

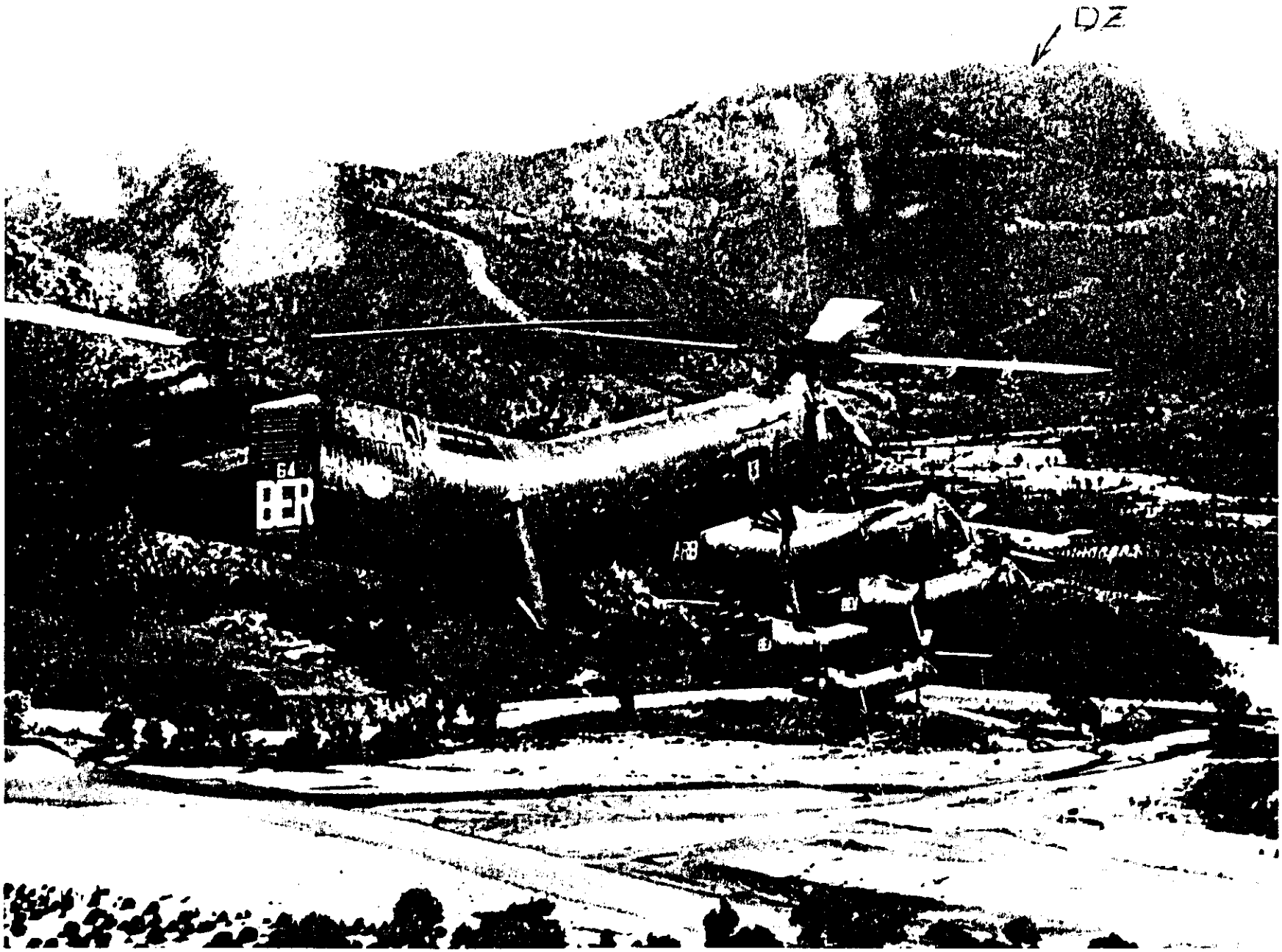
N O T E

Some of the information contained in this report is classified CONFIDENTIAL by the French Army. None of the material so classified is released for publication or reproduction in any form whatsoever. It is to be shown to or used only by military persons cleared by their respective authorities to receive such information.

VERTOL AIRCRAFT CORPORATION

T. R. Pierpoint
Director, European Operations

Bad Godesberg, November 1, 1959



Climb out formation in assault mission on Mt Djili. This is typical formation flown in an assault mission.

South Vietnam — 1961

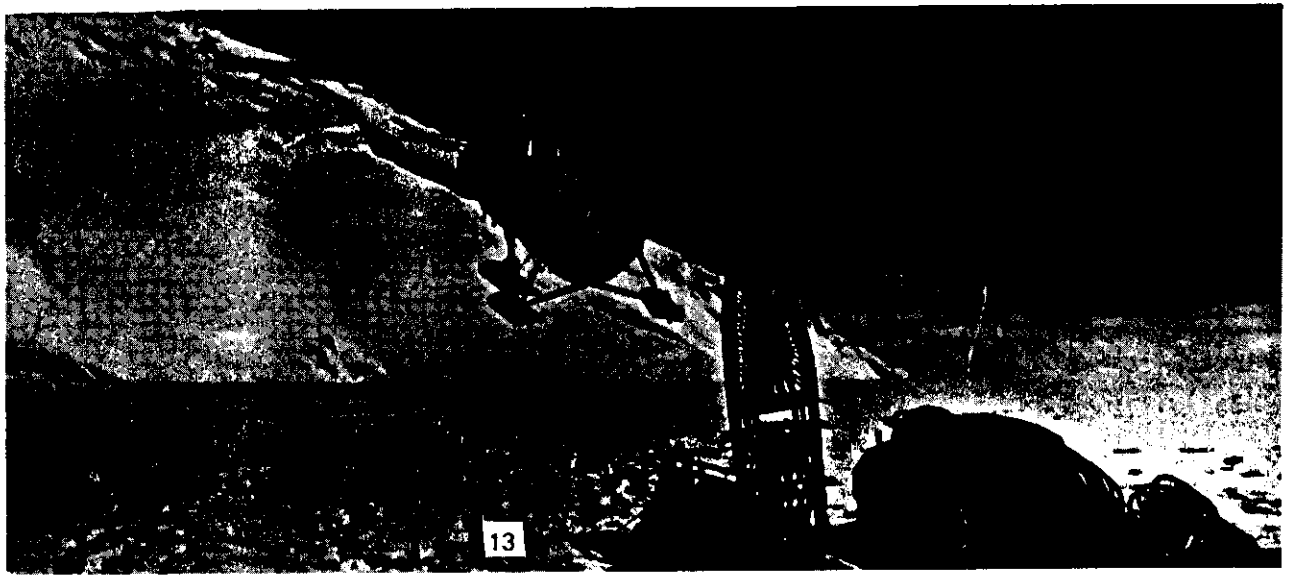
Another conflict to test the durable H-21 Workhorse — this time a world apart from the Algeria theatre — the Republic of Vietnam.

- December '61 saw the U.S. Army's 57th and 8th Trans Cos. operating the Vertol H-21s in South Vietnam to provide transportation and logistics support for the Vietnamese Army. Within a short time the army deployed three support companies of 20 CH-21s each. Since then the use of the helicopter has shown phenomenal growth, thereby providing tactical airmobility to a degree never before available or possible.
- To appreciate the growth of airmobility to the point it reached in Vietnam one must start with the initial deployment of U.S. Army and Marine helicopters to South Vietnam.
- The initial use of the CH-21 and CH-34 transport helicopters was for the movement of ARVN (Army of Vietnam) troops into combat against the VC (Viet Cong) and NVA (North Vietnamese Army). Along with this use, they were operated on medical evacuations of the ARVN forces, always a priority mission with the American forces.
- In the spring of 1965 it was realized that South Vietnam was losing the war. Therefore, in keeping with the agreement between the two countries and at their request, the U.S. started deploying combat troops, first the Marines, then the 1st Cavalry Division (airmobile), followed by a spate of other forces.

Headlines

The H-21 wasted little time in getting into the headlines of local and world media for such is the stuff of heroes.

- In 1953, a U.S. Air Force H-21 set two world records — one for speed at 146.7 miles per hour and the other for reaching 22,110 feet altitude — truly remarkable achievements for this new era of rotary wing flight.
- In 1956, a U.S. Army H-21 "Shawnee" nicknamed, "Amblin' Annie," became the first helicopter to fly non-stop coast to coast from San Diego, CA to Washington, D.C. using in-flight refueling. The flight stretched some 3,000 miles and took 37 hours to complete.
- "Helicopters complete historic 3,550 mile flight — the longest ever made by U.S. Army helicopters" — headlines in "The Pioneer," a Ft. Richardson, Alaska newspaper dated 22 Aug 1958. 15 of the Vertol H-21C "copters" belonging to the 80th Trans Company (light helicopter) arrived at the Alaskan army post after an historic 3,550 mile flight from Ft. Riley, Kansas — left 4 Aug, arrived 18 Aug 1958.
- A U.S. Army H-21C, No. 112, participated in the heroic rescue of two climbing parties who had conquered Mt. McKinley's 20,320 foot peak, the highest on the North American continent. As part of the most massive mountain rescue operation in U.S. history, H-21C No. 112 from the 80th Trans Co. landed at the climbers' base camp at Mt. McKinley's 10,200 foot level and removed all of the climbers to hospitals and safety (June 1960).



HISTORY OF VERTOL PRODUCT DEVELOPMENT

The year 1940 marked the origin of the Vertol Aircraft Corporation when a group of young engineers met to discuss their ideas on rotary wing aerodynamics and helicopter design. By 1943 this group was incorporated as the P-V Engineering Forum and had flown its first helicopter, the PV-1. Since that time, a steady program of growth and progress has placed the Company among the leaders in the field of helicopter flight. Advanced engineering concepts have now taken the Company into the new, broader field of aircraft capable of the desirable vertical take-off and landing characteristics of the helicopter combined with the favorable cruise characteristics of the fixed-wing aircraft.

The Company received its initial aircraft development contract from the United States Navy in 1945 for the purpose of designing and constructing the world's first tandem-rotored transport helicopter, the 10-place XHRP-1. This tandem configuration provided maximum lifting force and permitted loading of passengers and cargo without concern for in-flight balance problems. As a result, this design has continued to be incorporated in all the transport helicopters produced to date by the Vertol Aircraft Corporation.

With the successful flight test of the XHRP-1, production orders followed, making it necessary for the Company to expand. The year 1946 brought a design development contract for a Navy fleet utility helicopter prototype, the XHJP-1, which was highly successful in winning a Navy performance competition and which went into production as the HUP-1.

That year also brought a United States Air Force contract for a preliminary design study of a helicopter capable of long range rescue missions. In view of this additional business, the Company prepared for a future as a major aircraft manufacturer by a reorganization of its managerial methods. The Company was also refinanced to provide a substantial amount of new capital and changed its name to Piasecki Helicopter Corporation. In addition, a tract of ground was purchased in Morton, Pennsylvania, and construction began on a modern manufacturing plant. By the end of 1946 there were 400 employees.

In rapid succession, the Company—by winning industry-wide competitions—has developed and produced the 6-place HUP, the 14 to 22-place H-21 Work Horse, and the 40-passenger YH-16 Transporter. Its facilities have expanded to include several outlying plants with a total of 875,000 square feet. Employees number approximately 5,000.

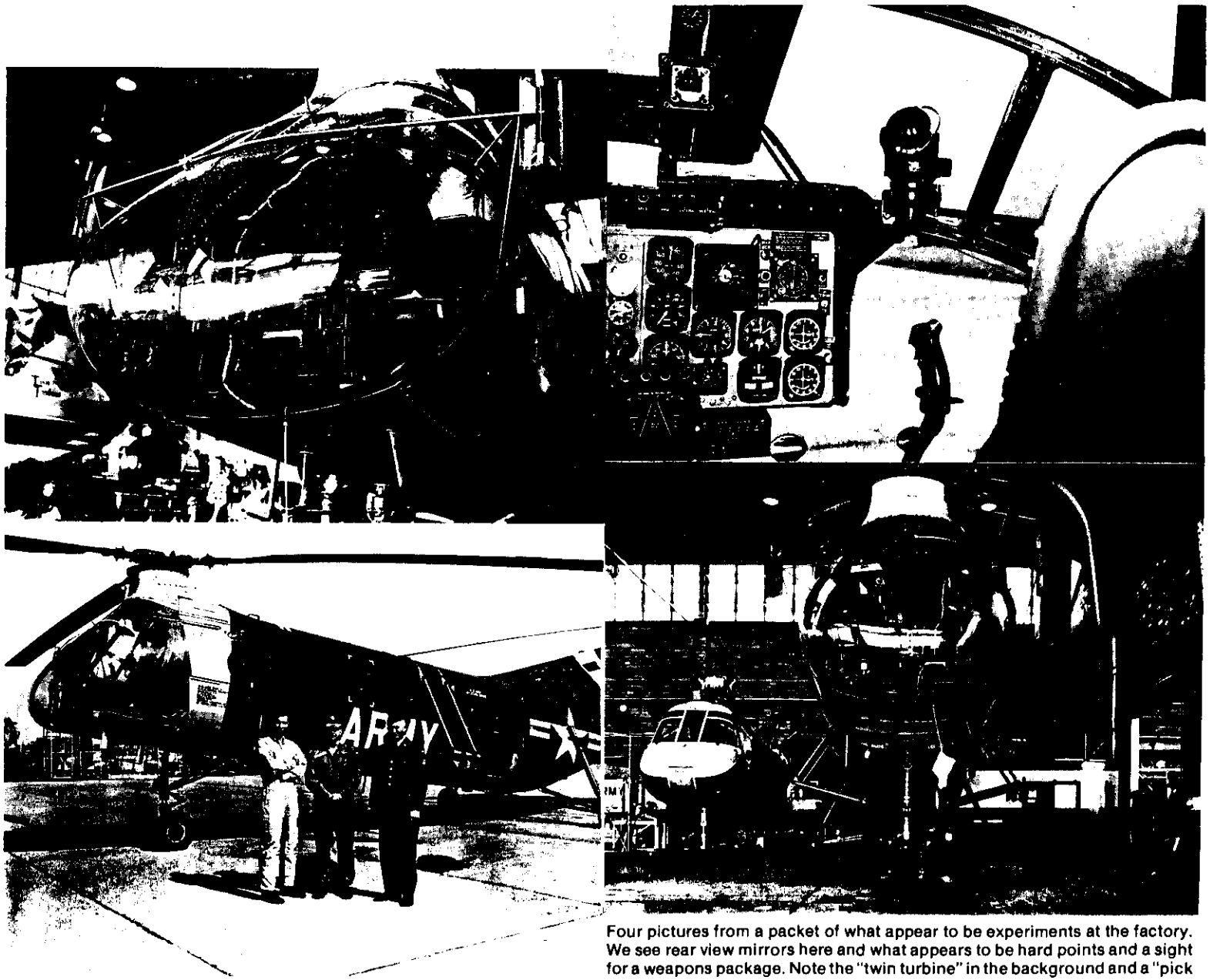
As transport helicopters have been integrated into military transportation systems, new uses have evolved. VERTOL helicopters have been used for development of many of these new missions. In natural and simulated disaster missions, helicopters have played an important part in saving lives and carrying supplies. In the 1954 and 1956 hurricane floods, thousands were rescued. During 1955 and 1956, in a mass evacuation by VERTOL 44's, top government officials were transported directly from the Pentagon Building in Washington, D. C., to emergency field headquarters following a simulated H-bomb attack.

VERTOL 44's have pioneered the use of rotary-wing aircraft in assault tactics, minesweeping and towing, and anti-submarine warfare. In addition, VERTOL helicopters are today carrying out long-planned concepts of mobility in the United States Army and Air Force.

With the expanding requirements for military and civil aircraft having the vertical rising characteristics of the helicopter along with the speeds and range of fixed-wing aircraft, the Company is actively engaged in investigations toward the design and construction of these new types. It was for this reason—expanding to the broader base of vertical take off and landing aircraft—that the Company changed its name in March, 1956 from Piasecki Helicopter Corporation, which infers limitation to helicopter production, to Vertol Aircraft Corporation. The new company name is derived from VERtical-Take-Off-and-Landing.

The Company has two wholly owned subsidiaries; Vertol Aircraft Company (Canada) Ltd., and Vertol International Corporation, both of which were organized in 1953 to provide service for the Company's aircraft stationed outside the United States. The facility of the Canadian subsidiary is located in Arnprior, Ontario, Canada, and currently provides overhaul service for Royal Canadian Air Force H-21's and Royal Canadian Navy HUP's.

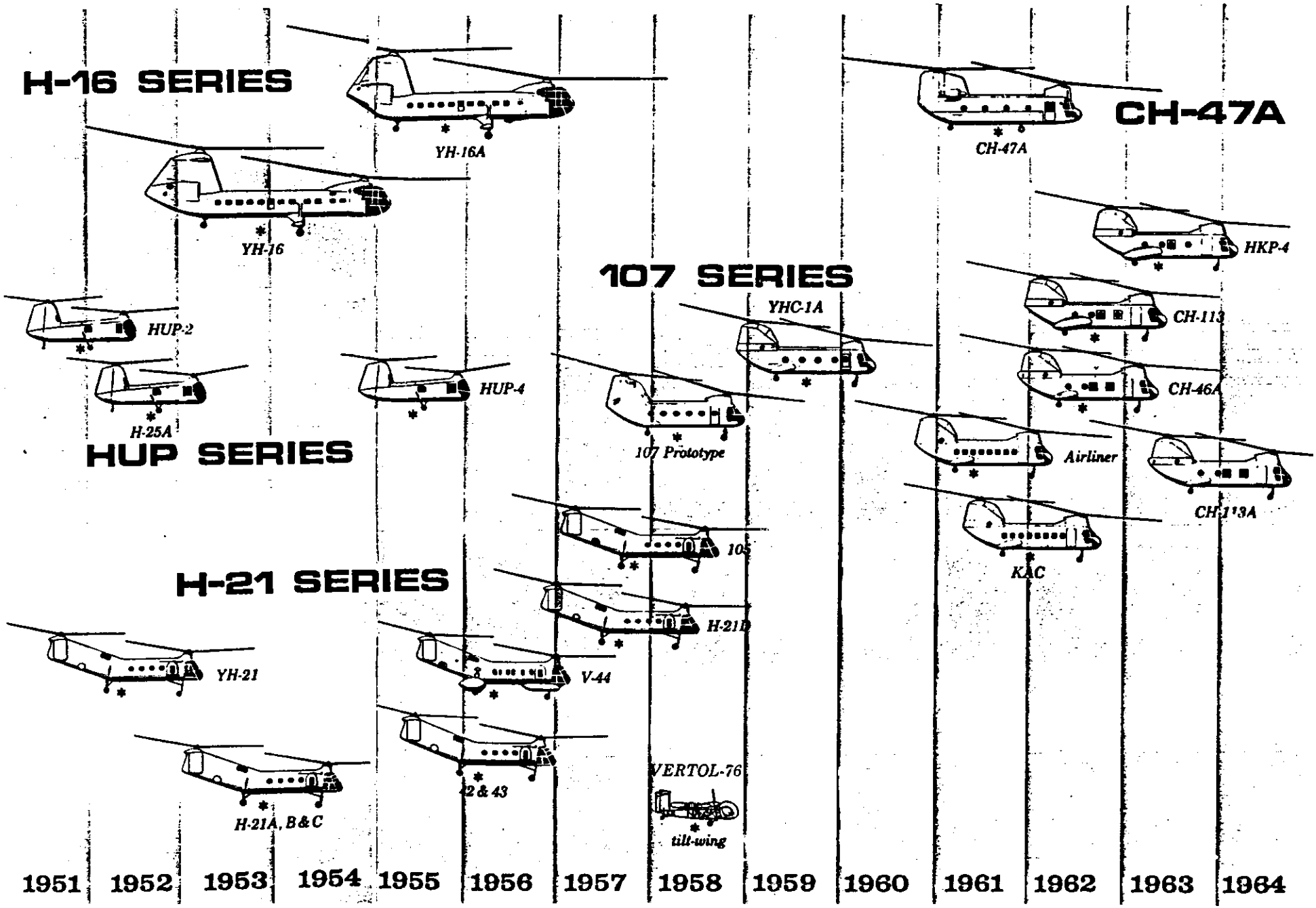
Although production to date has been devoted primarily to filling military commitments both in the Unitad States and abroad, certification of the VERTOL 44 for commercial use is imminent. Therefore the Company is prepared in the very near future to apply a portion of its production facilities to the commercial version of the VERTOL 44 in the configurations described in this publication.



Four pictures from a packet of what appear to be experiments at the factory. We see rear view mirrors here and what appears to be hard points and a sight for a weapons package. Note the "twin turbine" in the background and a "pick up" crew. Is that Major Bone?

A Boeing Vertol booklet entitled "Missions and Milestones" was published in 1964. The next few pages from that book illustrate the evolution of the tandem rotor helicopter design through the CH-47A which first flew in September 1961.

CHRONOLOGY OF PRODUCTS



107 SERIES

The Boeing-Vertol 107 was the result of foresight, investigation, and research.

Early in 1956, Vertol initiated a program to determine the optimum configuration for a twin-turbine-powered transport helicopter to meet the world-wide requirements of the coming turbine-engine era of the 1960's. This program, which lasted eighteen months, resulted in the 107 prototype design which made its initial flight in April 1958. The aircraft was widely and successfully demonstrated in the United States, Canada, Europe, and Asia.

By 1958, when the prototype first flew, Vertol had developed a successful interchangeable steel-spar rotor blade which had reduced vibration significantly. Another important advancement introduced in the 107 design was a flight control system that had been simplified by the elimination of longitudinal cyclic pitch. Differential collective pitch, for which the control components were already included, was used to effect longitudinal control. As a result, vibration actually decreased at speeds from 100 to 140 knots.

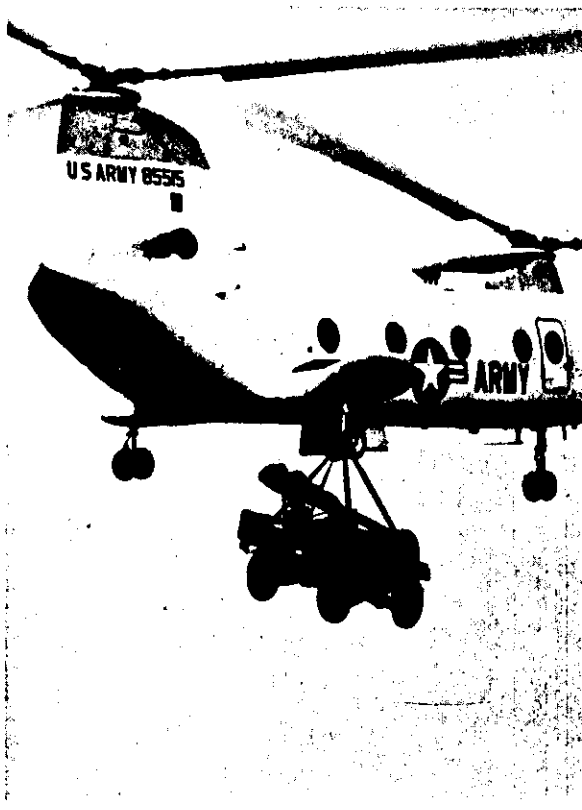
Emphasis was placed upon the compactness of the 107 design to minimize the amount of space occupied by aircraft aboard ship, and to reduce the vulnerability and camouflage problems under combat conditions. Ease of maintenance and low maintenance cost were stressed throughout the design phase, and each design detail by part, component, and installation was reviewed with these goals in mind. Whenever warranted, a "packaging" concept was adopted for removing and replacing assemblies, thereby simplifying and speeding maintenance on the 107. As many parts as possible were made interchangeable, and the number of parts was reduced because of the unusual simplification of design, resulting in low-cost production.

Refinements to the basic design resulted in the YHC-1A, developed for the U.S. Army, and first flown in August 1959.

Flight evaluations in both the YHC-1A and the 107 prototype were carried out by seven foreign military agencies, in addition to the U.S. Air Force and the U.S. Navy which concurred in the opinion that this aircraft represented a marked advance in design development.

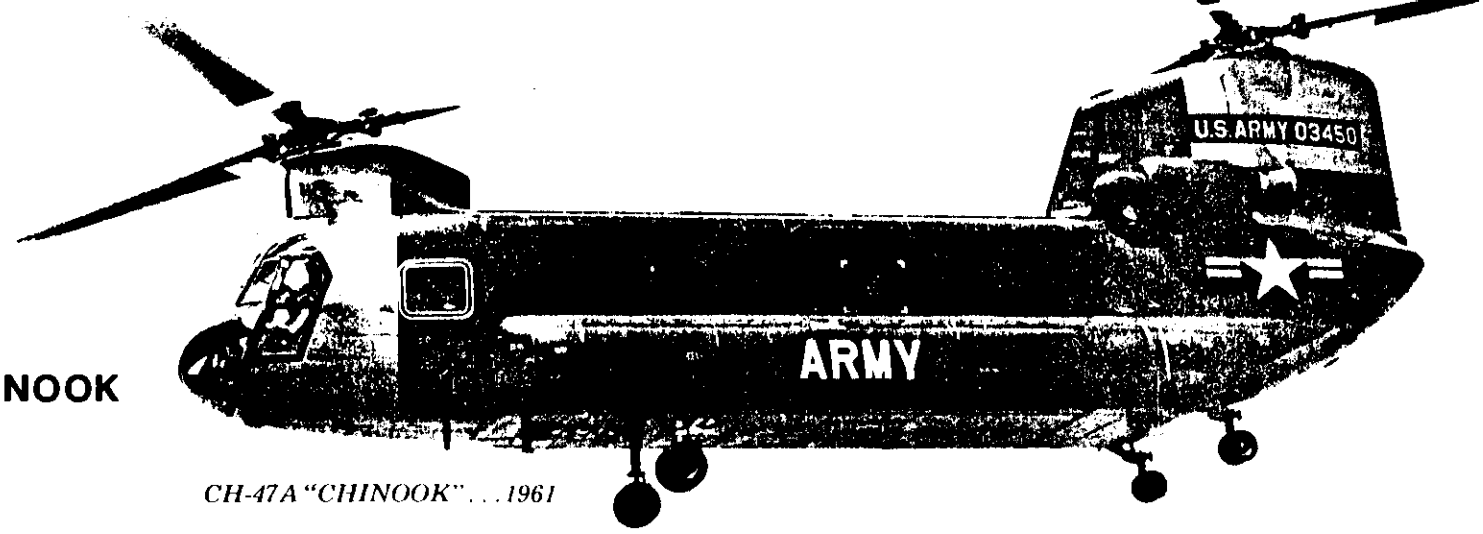
The fuselages of these twin-turbine-powered helicopters (redesignated by Dept. of Defense as CH-46Cs) are sealed at the factory, giving them flotation capability—able to land and take off on water without special equipment. The landing-gear/fuel cell stubs are also sealed, providing the helicopter with good stability when afloat.

The Boeing-Vertol 107-II was certificated in early 1962 by the Federal Aviation Agency as a transport helicopter, and entered commercial airline service with New York Airways the same year in a 25-seat Airliner configuration,

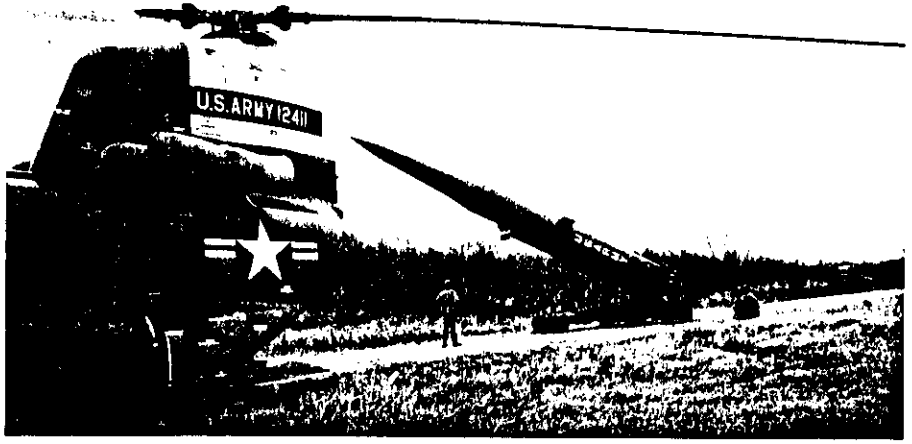


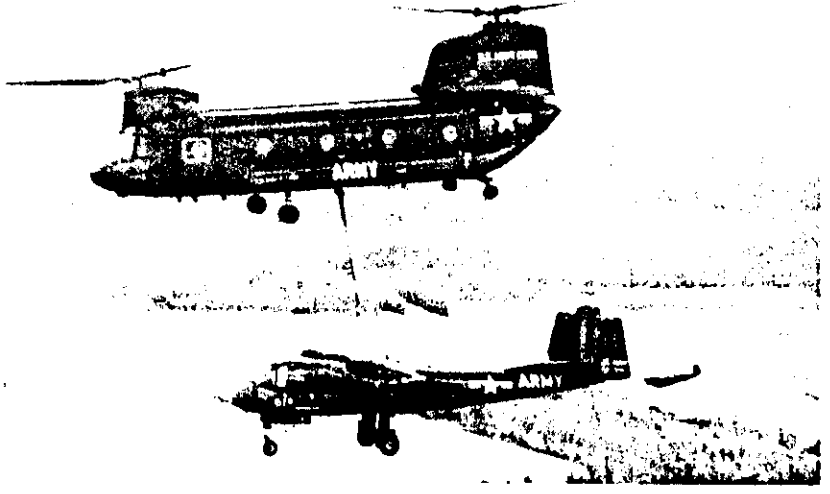
CH-46C . . . 1959

CH-47A CHINOOK



CH-47A "CHINOOK" . . . 1961





In September, 1958, following a design competition, the joint U.S. Army/U.S. Air Force Source Selection Board recommended to the Army that Vertol be selected to design and develop a new medium transport helicopter called the Chinook as a replacement for its obsolescent piston-engine powered transport helicopters. By May, 1959, the model specifications were approved and a contract issued. Now designated the CH-47A, the Chinook immediately went into design and development testing, and the first flight took place in September, 1961.

The Chinook, a twin-turbine tandem-rotor transport, is proving to be an effective and efficient infantry assault platoon carrier—having transported, repeatedly, a complete infantry platoon consisting of 44 combat-equipped soldiers. The Chinook has lifted a useful load of over 10½ tons. The first production Chinooks were powered by twin Lycoming T55-L-5 gas turbine engines, each with a military rating of 2,200 horsepower. The more powerful T55-L-7 engine, with a rating of 2,650 horsepower, has superseded the L-5, thereby increasing significantly the lifting capability of the Chinook. The Chinook is now in quantity production for the U.S. Army.

The Chinook incorporates features which give it excellent instrument flight characteristics as well as flotation capability. A rear ramp permits rapid straight-in loading and unloading of troops, vehicles, and cargo. It is fitted with an external cargo hook, enabling it to carry objects too bulky to fit within its payload compartment. Seats are provided for 33 combat-equipped troops, and a jump seat for either the crew chief or a troop commander. In combat operations, additional troops can be seated on the floor —as they were in Algerian operations and as they are being transported in South Vietnam. With seats folded against the compartment walls, there are provisions for 24 standard pole-type litters.

CH-47D CHINOOK

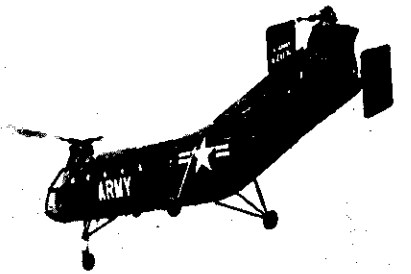
The Boeing Vertol CH-47D Chinook is the U.S. Army's only medium-lift helicopter. It is designed, qualified, and used for combat operations worldwide.

The CH-47D is a tandem-rotor aircraft powered by two Avco Lycoming T55-L-712 turboshaft engines, each capable of producing 4,075 takeoff shp. The helicopter's primary mission is the movement of artillery, ammunition, personnel, equipment, supplies and fuel on the battlefield. It also performs rescue, aeromedical, and parachuting missions. The aircraft can operate at night and in nearly all weather conditions.

The CH-47D has the greatest payload of any Army helicopter. Its useful load is nearly double that of the earliest CH-47A. In fact, the only resemblance a modernized CH-47D Chinook shares with its predecessors is its silhouette.

The CH-47D has a maximum gross weight of 50,000 pounds and can accommodate up to 44 combat-equipped troops. The CH-47D has three external-cargo hooks. The center hook has a capacity of 26,000 pounds; the forward and aft cargo hooks are rated at 17,000 pounds each. Internal cargo is loaded and unloaded through a rear ramp door. And it floats. The lower portion of the fuselage is sealed to permit water landings and takeoffs.

FORT RILEY



A lead off picture of our first CO's when the 57th and 98th were formed at Ft. Riley in 1957. You will note that Dick Orrell is a Captain (apparently reenlisting that young man) and Maj Bone is wearing the 6th Army patch so the photo was obviously taken at Ft. Lewis when both were much older.

This delivery flight, in Oct '57, shows Bob Herricks and Dick Orrell landing at the riverfront barge helipad in Pittsburgh. Tail number 117 may have gone from Ft. Riley on to air defense artillery units who were also getting CH-21s in 1957 to resupply remote battery locations.

23 April 1987

Dear Emmett,

Reference our AAAA discussions, I have researched everything that I have here in Pa. and have found very little. I think that I have most of the records from that era in MAryland in an old blacksmith shop. I have enclosed a complete listing of everyone that was in the company when we become an operational unit and left Fort Riley, Kansas. I will look in MAryland when I go down next weekend but this might be to late for what you are doing. I have also found enough information to list some events that occured during the period when the company and the Det was formed.

1.I transfered into the 98th from the 33rd as of 10 Jun 1957 so I assume that the unit was formed in June 1957(ironic it was the 57th formed in 1957) AS far as the 98th was concerned I know that the two original persons on orders were SFC Demko, Supply Sgt and myself.

2. All the pilots received their H-21 transition at Fort Riley with the AAUTC, Army Aviation Unit Training Command under the command of Ltc. Newton with the airfield commanded by Col Lincoln Wood(who recently passed away in Florida). Col Wood was not an aviator, Newton was and was a Bn Commander. All of our aircraft were received new by our pilots who ferried them from Vertol. In spite of what everyone says about the AH-64 Total Package Fielding being the first for the Army and Aviation, this is not true as we did the same thing at Fort Riley during the late 50's. We trained as a company with the U-1 Otter company playing a support role and took our Army Training Test at Fort Riley.

3. Incidents at Fort Riley.

a. WO Brown and I assembled 2 H-23C's from boxes and flew them without the first minute of training time since we both were qualified in OH-13s. I don't remember taking them to Fort Lewis, I believe they stayed.

b.Jack Reyes(WO) was in a three ship formation over west Kansas and all of a sudden velled engine failure and autorotated into a pasture with no damage to either the pasture or the helicopter. I was along and landed beside him and heard the R 1820-103 running like it should and I went into the cockpit and asked Jack what he had done, he had an engine tach failure and did not know the engine was still running.

c.During night training(cross country) one crew coming back from Topeka to Marshall Army Airfield lost an engine autorotated in a corn field with no damage. The next morning we went out to replace the engine however before we did that I drained the fuel and got 1 1/2 gals in a can and was then sure fuel exhaustion existed. We carried out about ten five gallon cans and the engine started and ran fine. This is the only time I can remember giving an aviator a commendation followed immediately by a reprimand. I do not remember the crew.

4. As I remember, we crashed at least one during training and perhaps two, one during an autorotation by landing on one strut and simply knocking it off and the bird rolled, the other one I believe had some injuries when a front right cargo door came off in flight over the hill that paralleled the airfield, again I do not remember crews or actual situation.

5. During one field exercise I remember that it got so cold that it took us several hours to get one helicopter started and as soon as we did we kept it flying and rotated our personnel on the flights to get them warm because if you remember the heater on the H-21 was super if it worked. I am sure that day we refueled while the aircraft was running. This was the same time that we ran out of eggs for breakfast and had to eat beans instead.

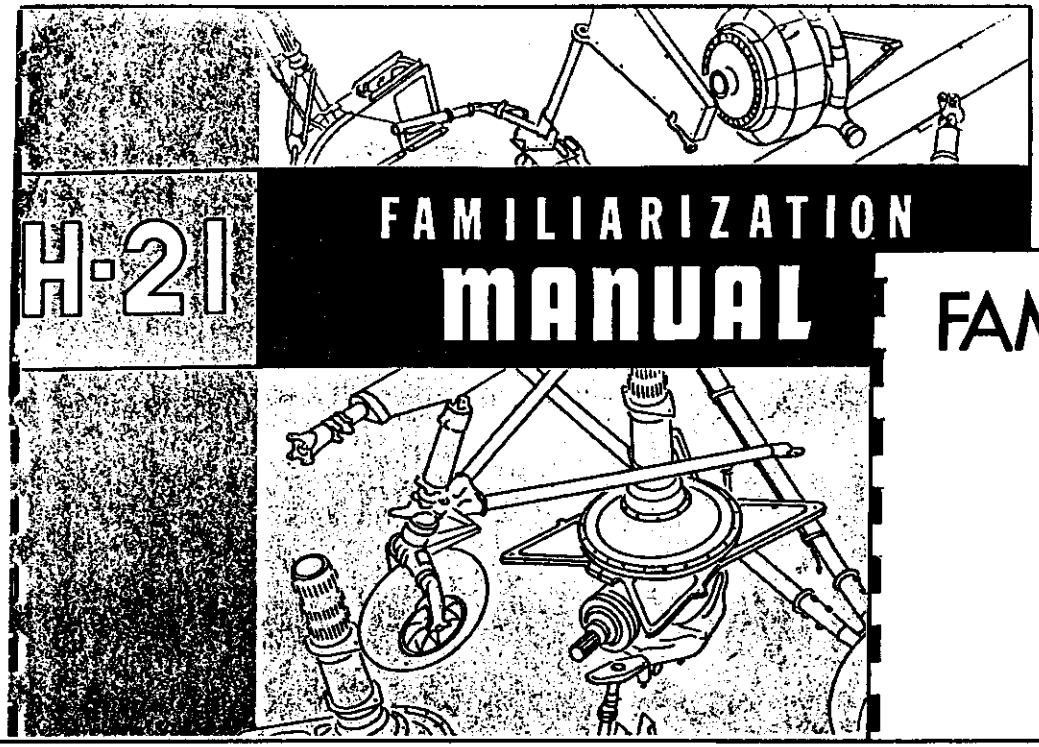
6.I remember my promotion to Captain, we finished our ATT and one of the umpires said that we almost failed because of one officer being consistently out of uniform and asked MaJ. Bone why he had let that occur since it set a bad example, of course it was me and my promotion orders had come in while we in the field and MaJ Bone pined them on in front of both the 98th and 57th. Needless to say I was happy because of both the promotion and that we had passed our ATT.

7.Last but not least of course, bad day at Red Bluff. Perhaps one of the longest days of my life, I had worked all night with a machinist from Chico, Calif to machine a bellcrank to put in a new bearing since the old bearing had been found on PostFlight to be a real hazard and about ready to fall out. We finished and installed the bellcrank sometime after midnite and I rolled out at about 0530 because that helicopter had to have a test flight. I did this in the traffic pattern at low level because of low clouds, finished and the flights were ready to go. I left late with the idea that I would catch up at the first gas stop, one flight was already in Fort Lewis. The rest of course is history with one side issue and that was that the aircraft that I had replaced the bearing in the bellcrank crashed and I worried sick that this perhaps was the cause, as soon as the critical things were taken care of I inspected that aircraft first and found the bell crank in place working as it was supposed to be. This accident made me aware of the need to have all pilots instrument rated which I pursued the rest of my time in the Army to the extent of never turning anyone down who desired an instrument ticket and never failing anyone on a check ride. I reride many sometimes up to 15-20 hours but when they finished I knew that were capable of flying in weather in the aircraft that they were qualified in.

I assume you know what happened at Fort Lewis with Rocky Shoals, the filming of the movie "Mountain Road" and the ill fated rescues in the mountains as well as the day we were not allowed to take an H-21 to Mt. Rainier. I will look for additional momentos when I go to the Shore next week. Please tell everyone that we are going to be ther but can't arrive until about 1830 at Dothanand Rucker sometime later. I will remind Mo and Jerry also, Betsy si graduating from Virginia Tech and I can't miss that. Plan to see you for sure on 23 May but I will talk to you prior.

Best regards,

Dick

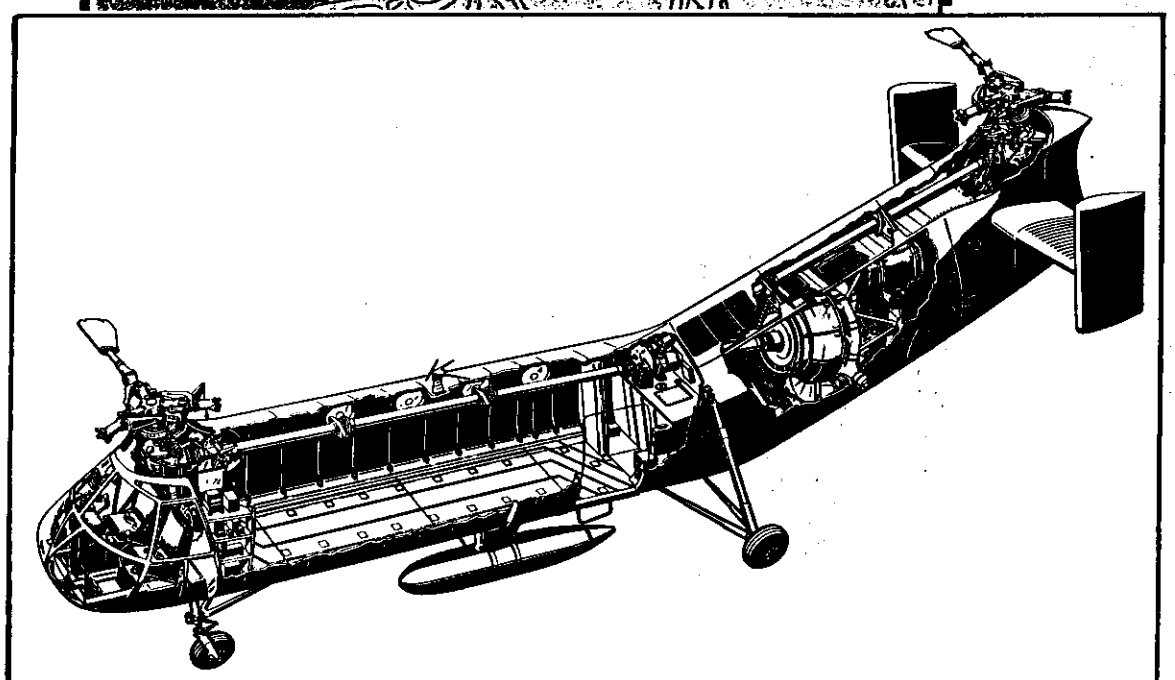


Some pages from the book. The Familiarization Manual was used at the Vertol plant in Morton, PA, where newly assigned pilots were transitioned into the H-21.

FAMILIARIZATION MANUAL

NOTE:
This manual is published for familiarization purposes only & not to be used in lieu of the applicable technical order.

TECHNICAL SERVICE SCHOOL
SERVICE DEPARTMENT
July 1957



TYPICAL MODEL H-21 SERIES CUT-AWAY VIEW

57TH TRANSPORTATION COMPANY (LT HEL) (H-21)
Fort Riley, Kansas
MANNING CHART TOE# 55-57C

COMPANY HEADQUARTERS

TITLE	AUTH RANK	MOS	NAME
COMPANY CMDR	MAJ	1983	Bone
OPNS OFFICER	CAPT	1983	KINNEY
FIRST SGT	E-7	001.8	FARVOUR
ADMIN SUPV.	E-7	717.60	Ignacio
ACFT. OPN. SGT	E-7	674.60	WATTS
MESS STEWARD	E-6	941.60	Moody
SUPPLY SGT	E-6	768.60	Leisner
FIRST COOK	E-5	941.10	Peters
" "	"	"	BANKS
COMPANY CLK	E-4	716.10	Calvo
COOK	E-4	941.10	
"	"	"	
PERS ADMIN CLK	E-4	716.10	TUNNELL
" " "	"	"	Kelly
SR SWBD. OPER.	E-4	310.00	
COMM. CLK.	E-3	720.00	
COOKS HELPER	E-3	940.00	Moore G
LT. TRK. DRIVER	E-3	550.00	WALZELL
RAD. TT. OPER.	E-3	050.00	
SWBD. OPER.	E-3	310.00	
MIREMAN	E-3	310.00	

COOK

MAINT SECTION HQ

TITLE	AUTH RANK	MOS	NAME
MAINT. OFFICER	CAPT	4823	ORRELL
ASST. MAINT OFF	WO	4823	RICE
PLATOON SGT	E-7	674.60	STANFORD
CREW CHIEF	E-5	672.10	Entwistle
" "	"	"	HURST
CRASH RESCUE	E-5	525.10	Rezny
" "	"	"	COFFELL
SR. RAD. MECH.	E-5	311.10	LUCAS
ACFT. PARTS SPEC	E-4	776.10	SCOTT
CLK. TYPIST	E-4	711.10	MOORE
HCPTR MECH	E-4	672.10	HINTON
PETRL. DISPN.	E-4	552.10	CLARK
" "	"	"	ORR
RAD. MECH	E-4	311.10	Lewis
WVEH. MECH	E-4	631.10	SOLDER
ACFT MNT CREWMAN	E-3	670.00	GEUWENBACKER
LT TRK DRIVER	E-3	760.00	PROEFROCK
WVEH MECH HELPER	E-3	630.00	Giese

Spec Tools — GEUWENBACKER
Tech Supply — Scott
Co Supply — WALZELL

1st MAINT SECTION

TITLE	AUTH RANK	MOS		
FLIGHT CHIEF	E-6	674.60	Quinn	
CREW CHIEF	E-6	674.10	Poynter	047
" "	"	"	Antle	048
" "	"	"	Steffen	049
" "	"	"	Henley	050
" "	"	"	Devlin	052
" "	"	"	Thompson	058
" "	"	"	Wood	020
HCPTR MECH	E-5	674.10	RAMSTETTER	
" "	"	"	THALDORF	
" "	"	"	OSGOOD	
" "	"	"	BILLER	
" "	"	"		
" "	"	"		
" "	"	"		
ACFT MNT CREWMAN	E-4	670.00		
" " "	"	"		
" " "	"	"		
" " "	"	"		
" " "	"	"		
PETRL. DISPN	E-4	552.10	VANFleet	
" " "	"	"		

2nd MAINT SECTION

TITLE	AUTH RANK	MOS	NAME	
FLIGHT CHIEF	E-6	674.60	SQUIER	
CREW CHIEF	E-6	674.10	Read	055
" "	"	"	IVES	056
" "	"	"	MCCALL	
" "	"	"	Linne	059
" "	"	"	Ellis	060
" "	"	"	Dillard	061
" "	"	"	Bowman	017
HCPTR MECH	E-5	674.10	HARMS	
" "	"	"	Hundley	
" "	"	"	Franco	
" "	"	"	Keith	
" "	"	"	Tull	
" "	"	"	Dysart	
" "	"	"		
ACFT MNT CREWMAN	E-4	670.00		
" " "	"	"		
" " "	"	"		
" " "	"	"		
PETRL. DISPN.	E-4	552.10		
" "	"	"		

3rd MAINT SECTION

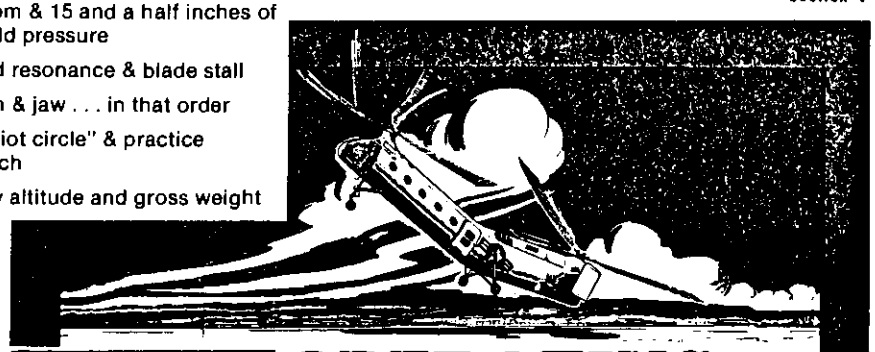
TITLE	AUTH RANK	MOS	NAME	
FLIGHT CHIEF	E-6	674.60	DUVALL	
CREW CHIEF	E-6	674.10	Powers	062
" "	"	"	Yates	064
" "	"	"	Vanderhoner	065
" "	"	"		069
" "	"	"	Kuehneisen, D	071
" "	"	"	VISCAINO	019
" "	"	"	DICKSON	249
HCPTR MECH	E-5	674.10	DRENAN	
" "	"	"	Henry	
" "	"	"		
" "	"	"	Harvey	
" "	"	"		
" "	"	"	Spothelf	
" "	"	"	Freeman	
ACFT MNT CREWMAN	E-4	670.00	Kostetsky	
" " "	"	"		
" " "	"	"		
" " "	"	"		
" " "	"	"		
PETRL. DISPN.	E-4	552.10	Wurtz	
" "	"	"		

From an old Dick Orrell file folder.

This chart survived printed on a well used manila folder. The names are familiar because most of these soldiers remained with the unit for several years. The tail numbers in the margins also have a familiar ring — like Art Kinney's 055 and was it 071 or 061 that flew with the maintenance guys as Tail End Charley in RVN?

The dog chewed up a lot of the old manuals years ago, but here are some pages picked at random. Who can forget

- — 2700 rpm & 15 and a half inches of manifold pressure
- — Ground resonance & blade stall
- — Friction & jaw . . . in that order
- — The "idiot circle" & practice approach
- — Density altitude and gross weight



SECTION V OPERATING LIMITATIONS

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OPERATING LIMITATIONS.

The operating limitations of the helicopter as discussed in this section are a result of extensive flight testing and experimentation. The limitations which are marked on the instruments, illustrated on the following pages, are not necessarily discussed in the text. Further explanation of the instrument markings, when necessary, is covered under the appropriate headings.

Note

The instrument markings illustrated in figure 5-1 are the actual values on which engine and helicopter performance are based. Instrument readings, power settings, airspeeds, etc., referred to throughout the text of the handbook are rounded off to the nearest readable figure. When any discrepancy exists, the markings shown in figure 5-1 should be considered the most accurate.

MINIMUM CREW REQUIREMENTS.

The minimum crew required to fly the helicopter safely, under normal non-tactical conditions, is a pilot. A co-pilot, rescue hoist operator, litter attendant, or other crewmembers may be added at the discretion of the Commanding Officer.

Note

A minimum crew of two qualified pilots is required for flight under instrument conditions.

ENGINE LIMITATIONS.

The engine must be inspected if the following conditions occur:

1. Engine overspeeds between 2780 and 3000 rpm.
2. When power exceeds take-off MAP for less than 15 seconds and does not exceed 61.5 inches Hg.

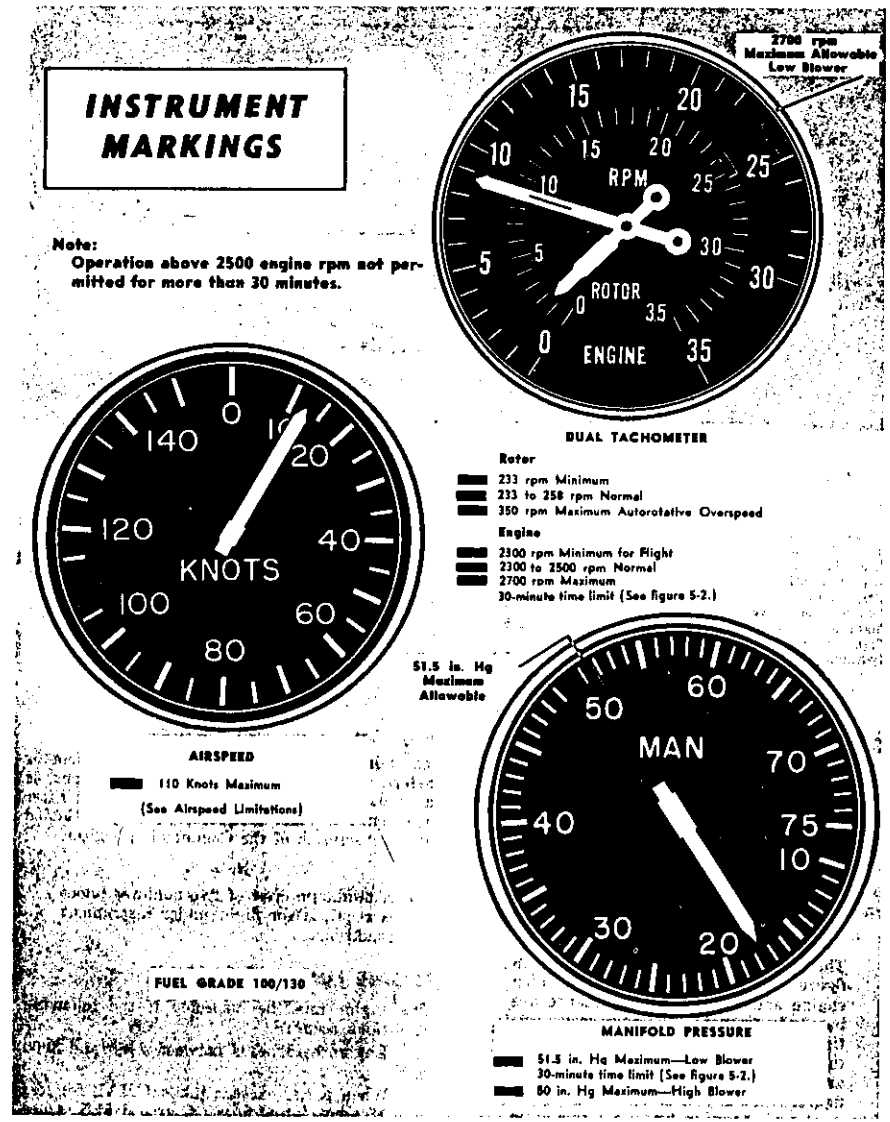

Figure 5-1. (Sheet 1 of 4)

SECTION VI FLIGHT CHARACTERISTICS

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GROUND RESONANCE.

Ground resonance is a vibratory condition present in a helicopter while on the ground with its rotors turning. It cannot occur in flight. Resonance results when unbalanced forces in the rotor system cause the helicopter to rock on its landing gear at or near its natural frequency and the problem of its elimination is complicated by the fact that as lift is applied to the rotors, the natural frequency of the helicopter changes. The design of the helicopter is such that with all parts operating properly, the landing gear oleos and rotor blade lag dampers will, by energy dissipation, prevent the resonance from building up to dangerous proportions. Improper adjustment of the oleos, incorrect tire pressure, and defective lag dampers are the major causes of ground resonance.

FLIGHT CONDITIONS CAUSING GROUND RESONANCE.

It ia possible to enter ground resonance when operating under the following conditions:

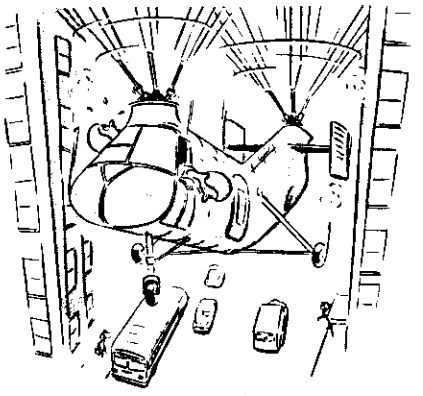
1. Taxiing with a high power setting allowing the helicopter to be very light on the wheels.
2. When operating at high power with the helicopter very light on the wheels.
3. Rapid lateral oscillations of the cyclic stick while the helicopter is light on its wheels. Refer to Section III for recovery.

WARNING

If ground resonance is allowed to build up, it may cause destruction of the helicopter.

STALLS.

The helicopter is not subject to conventional stalls; however, rotor speed should be kept above the minimum to prevent excessive coning and undue stress of the rotor blades.



CAUTION

Rotor speeds below the minimum will result in blade coning beyond the safe limits. Rotor speeds in excess of the maximum limit will lower blade lift efficiency.

BLADE STALL.

As the helicopter rotor moves into forward flight at a given rpm, it is clear that as the blade moves in the direction of flight (advancing blade) it experiences a velocity which is composed of its rotational velocity added to the forward speed. On the other hand, as it moves away from the direction of flight (retreating blade) it experiences a velocity lower than its rotational velocity by the amount of the forward speed component. Since the blade lift is proportional to the square of the velocity, the blade angle of attack must be varied cyclically (by feathering, or flapping, or both) to compensate for the variation in lift as the blade rotates.

As the helicopter gains forward speed, more and more increase in retreating blade angle is required to maintain the lift until the blade reaches its stalling angle and the resulting loss of lift, increase in drag and change in pitching moment cause a cyclical roughness described as "blade stall".

The advancing blade, however, in spite of operating at a lower and lower angle aa forward speed increases, ultimately encounters a difficulty of its own. Since the velocities are added, the resultant speed at the blade tip begins to approach the speed of sound as rotor speed and forward speed increase and it may be expected that a similar cyclical roughness will finally develop.

Note

Vibration from blade stall will possibly feed back to the controls with the hydraulic boost system on.

Execution of one or a combination of the following will overcome blade stall:

1. Increase rotor rpm.
2. Decrease airspeed.
3. Reduce collective pitch.
4. Decrease altitude (if possible).

CAUTION

Maneuvers will increase the tendency to stall and must be avoided under the conditions described above.

SEVERE BLADE STALL.

Under certain flight conditions (or during power-off touchdowns), it is possible to manipulate the controls so that severe blade stall results in a loss of lift of the retreating blade, causing the forward rotor blade to drop downward excessively as it approaches the fuselage. This may result in the blade striking the fuselage.

Combinations of the following operational factors should therefore be avoided:

1. Excessive Control — Application of large amounts of collective pitch and aft cyclic control may result in the forward blades exceeding the stalling angle of attack during such conditions as:
   a. Steep flare maneuvers.
   b. Attempts to cushion nose wheel touchdown during autorotative landing.
   c. Severe turbulence.
2. Insufficient Rotor Speed—Reduces the effectiveness of collective pitch and longitudinal control so that the pilot tends to use excessive control.
3. Steep Turns—When collective pitch is used to maintain altitude in a steep bank, the angle of attack of the rotor blades is increased tending toward blade stall.
4. High Airspeed—For any combination of the above factors, an increase in airspeed will result in more severe blade stall.

GENERAL FLIGHT ENVELOPE.

When the helicopter is operated at airspeeds in excess of those labeled "Incipient Blade Stall," figure 6-1, vibration will become excessive and a considerable increase in power will be necessary. Operation at airspeeds outside of the other limiting values of the curves is not possible due to power limitations and will result in power settling. Hovering ceiling is indicated at the points where the weight curves intersect the zero airspeed line. The service ceiling is indicated by the peaks of the weight curves.

mission, it is probable that the limit switches in the clutch actuator are malfunctioning. This warrants shut-down and inspection for adjustment or repair except when flight is absolutely necessary. The procedure to follow in an emergency to determine engagement status is to perform the Functional Engagement Check presented under Rotor Clutch Engagement.

ROTOR CLUTCH ENGAGEMENT.

CAUTION

Rotor engagement must not be attempted when the clutch warning light is already on. Under this condition the clutch will travel immediately into the jaw position instead of starting friction engagement. The resultant damage to the rotor system will be the same as during any other premature jaw clutch engagement.

To engage the rotors, first throttle the engine to indicate 1200 rpm. Lift the guard from the friction clutch switch, and place the switch in the FRICTION position. Lock switch in this position with the guard. Maintain constant throttle setting until the engine tachometer indicates approximately 900 rpm. This throttle setting may then be maintained until engine and rotor rpm are synchronized. Engine and rotors should synchronize in 8–15 seconds. An adjustment of the friction clutch may be required if engagement requires more or less time than aforementioned. Do not permit engine speed to drop below 800 rpm during engagement.

Note

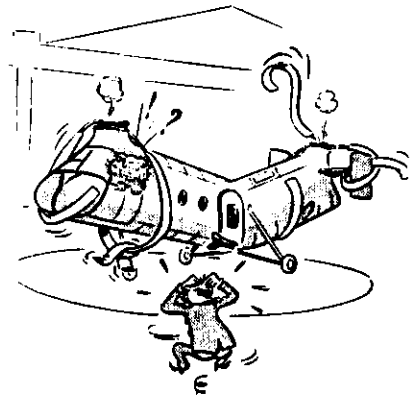
If, while engaging the clutch, the engine speed is allowed to drop below 800 rpm, and it is necessary to disengage the clutch to prevent stalling the engine, the clutch actuator need not be cycled before re-engagement; provided the clutch has not been operated beyond the FRICTION position.

The jaw clutch may be engaged only when the tachometer needles are synchronized. Synchronization of the needles is essential during the entire time required for jaw clutch engagement. The jaw clutch light will go out when clutch is fully engaged. Release the jaw clutch spring-loaded switch; it will return to the OFF position. The friction switch must remain in the FRICTION position until the clutch is to be disengaged.

CAUTION

In the event the jaw switch is actuated before synchronization of engine and rotor rpm, shut down immediately and inspect rotor and drive system for damage.

Disengage clutch immediately if oil pressures are not indicated in the forward, mid, and aft transmissions within approximately two minutes.



CAUTION

Make certain the rotor and engine tachometer needles are synchronized before engaging jaw clutch.

FAILURE OF JAW CLUTCH TO ENGAGE.

It is possible that the clutch actuator will satisfactorily engage the friction clutch but will fail to engage the jaw clutch. This condition generally results from low battery voltage, but it may also be the result of defective actuator wiring or a high slip clutch torque setting which causes the actuator motor to stall. To determine if the condition is merely the result of low battery voltage, the following procedure is recommended:

1. With friction clutch engaged and engine and rotor rpm synchronized, slowly increase engine rpm to a point where the voltmeter indicates the generator is charging (approximately 1300–1500 engine rpm).

CAUTION

Do not increase engine rpm unless needles are synchronized, as this may result in damage to the friction clutch due to excessive heat from slippage.

2. When the generator is charging, the jaw clutch switch may be placed in the ENGAGE position.

CAUTION

Do not run up engine when friction clutch only is engaged. Such action warps the bronze friction plates and discolors the steel plates due to the extreme heat generated when the clutch plates slip.

If the actuator still fails to engage the jaw clutch, the actuator is defective and must be replaced.

3. If an auxiliary power unit is available, a jaw clutch engagement should be attempted with the APU plugged in and the battery switch turned OFF.

CAUTION

If an APU is used, make certain that it is disconnected immediately after the jaw clutch is engaged to prevent a possible take-off with the APU still attached to the helicopter.

MANUAL CLUTCH ENGAGEMENT.

Should the electric clutch actuator fail, it is possible to engage the clutch manually by using the cutch manual engagement wrench.

Note

This method of engagement is to be used as an emergency measure only. The circuit breakers and connections should be checked before resorting to manual engagement.

The following procedure must be followed with the pilot and an assistant acting in close coordination:

1. The clutch actuator linkage must be disconnected.

2. The manual engagement wrench is placed over the clip on the operating mechanism so that the large plug engages the hole in the operating cam, and the pin guide engages the slot in the jaw clutch cam.

3. The holes in the clip and the retainer in the wrench are aligned. Insert the pin attached to the wrench and lock in place with the hook.

4. After the wrench is installed and locked in place, and before the engine is started, several practice engagements and disengagements should be made to ensure that the installation is correct and that the wrench stops at the correct positions.

5. After the engine is started, the crewmember must wear earphones in order to clearly understand the pilot's instructions.

6. After the pilot has stabilized the engine rpm at 1200 he will instruct the crewmember to "engage friction." The crewmember will then rotate the wrench in a counterclockwise direction until the pin hits the jaw clutch cam follower bearing. At this position the friction clutch is fully engaged.

7. The crewmember will maintain the first stop position until the pilot instructs him to "engage jaw." The pilot must not ask for jaw engagement until engine and rotor rpm are synchronized and steady. Upon the pilot's signal, the crewmember will depress the lever on the side of the wrench handle. This raises the pin and allows the pin guide to pass over the jaw clutch cam follower bearing. The wrench may then be rotated counterclockwise until the jaw clutch is fully engaged. The crewmember will then notify the pilot that full engagement is completed. The wrench will remain attached while the actuator is inoperative.

8. To accomplish manual disengagement, the engine should first be shut down and the rotors allowed to come to a complete stop. The crewmember will then take his station by the clutch, and, on receipt of the order "disengage" from the pilot, he will move the wrench to the fully disengaged position.

CAUTION

During manual engagement and disengagement the crewmember must wait at all times for verbal instructions from the pilot to perform each step of the procedure.

FUNCTIONAL ENGAGEMENT CHECK.

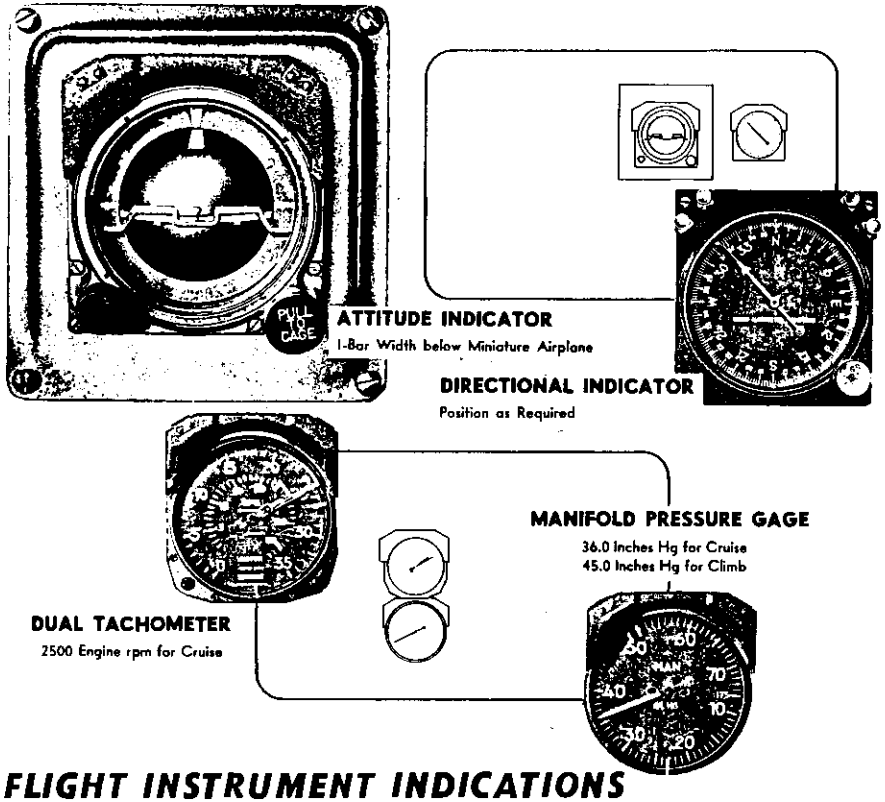
Check the clutch for proper functioning at 2300 engine rpm. While increasing throttle, watch to see that the tachometer needles stay together and show no tendency to split. Any tendency to split while increasing throttle would indicate slippage; therefore, it would be obvious that the jaw clutch was not engaged. At 2300 engine rpm, close the throttle rapidly so that the jaw coupling will override. If the needles split, indicating override, the clutch is functioning properly. If the needles should fail to split when throttle is decreased rapidly, the indication is that the friction clutch is engaged and the jaw clutch is not engaged. If the needles do not split, move the friction clutch switch to DISENGAGE. The needles should then split, and it is safe to stop the engine.

Note

In cold weather, it may be necessary to engage at a higher rpm but the engine speed should not exceed 1500 rpm nor fall below 800 rpm.

ROTOR CLUTCH DISENGAGEMENT.

In order to disengage the clutch system, it is necessary to take advantage of the overrunning action between the driver jaw (connected to the



FLIGHT INSTRUMENT INDICATIONS (Gross Weight above 12,000 Pounds)

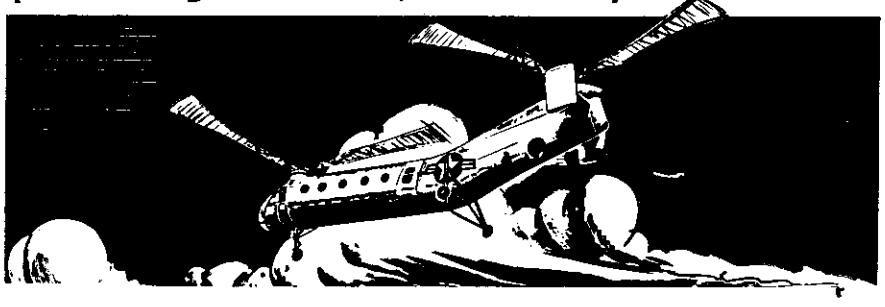


Figure 9-1

MAXIMUM GROSS WEIGHT FOR HOVERING TAKEOFF

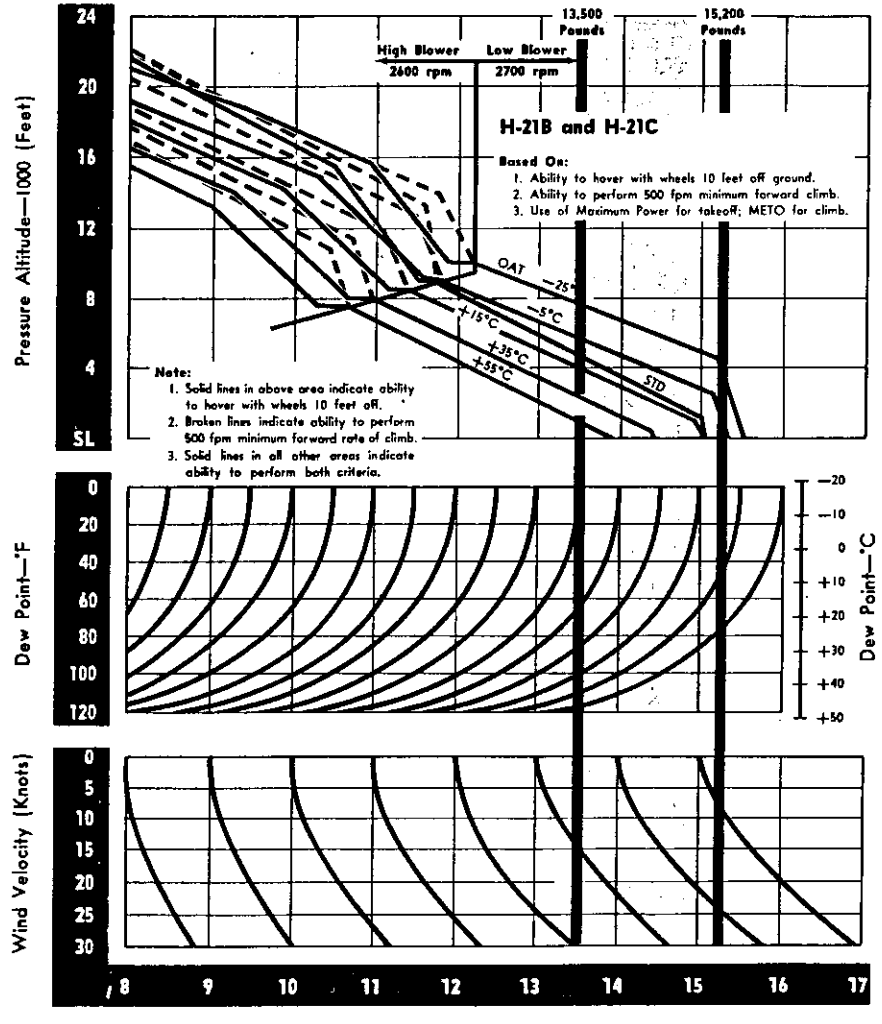


Figure A-4. Maximum Gross Weight for Hovering Takeoff Chart

AIRCRAFT CLEARANCE

(DELIVER DUPLICATE TO BASE OPERATIONS AT DESTINATION)

DATE: 17 Oct 57

A. OPERATIONS OFFICE: MARSHALL FIELD, FORT RILEY, KANSAS

AIRCRAFT SERIAL NO.: 56-2015

B. OCCUPANTS (State whether crew or passenger. List additional passengers on separate sheet and attach.)

DUTY	NAME AND INITIALS	GRADE	SERVICE NO.	ORGANIZATION	HOME STATION
PILOT IN COMMAND P	ORRELL, H. M.	1Lt	01873382	57th Trans Co	FRI
P	Cummings L. W.	WO1	W2207952	"	"
CE	Mathews J. W.	Pvt-2	ER16534360	"	"
Z	Squire, M. R.	SFC	RA44115280	"	"
ZZ	Sanders, D	M Sgt	RA[illegible]	"	"
Z	Bangston, Paul T.	Sgt	RA[illegible]	"	"
Z	Michael	Civ	—	Post TC	"

C. FLIGHT PLAN

RADIO CALL: R-62015 | AIRCRAFT TYPE: H-21C

POINT OF DEPARTURE: MARSHALL FIELD, FORT RILEY, KANSAS

BASE NAME OF DESTINATION: Schilling AFB

ROUTE TO BE FLOWN

IFR	VFR	ALTITUDE	ROUTE	TO
	✓	VFR	DIR	Schilling AFB

MILEAGE: 50 NAUT. | ETD: 0900

EST TRUE A/S: 85 KTS. | ETE: 00+45

ALTERNATE: — | ETE TO ALTERNATE:

TRANS. FREQ.: UHF - ALL

PILOT'S LAST NAME: ORRELL

FUEL ON BOARD: 3 HRS. 30 MIN.

INSTRUMENT RATING

NAVY	AIR FORCE	ARMY
SPECIAL PILOT	PILOT RATING	PILOT RATING 3
STANDARD PILOT	INST RATING	INST RATING 3

DATE INSTRUMENT CARD EXPIRES: —

DD FORM 365F FILED AT: — | DATE FILED: —

HIGHEST RANK ON BOARD: —

REMARKS

Herman M. Orrell
(SIGNATURE OF PILOT)

D. WEATHER

EXISTING		
DESTINATION	TIME OF OBS	
ALTERNATE	TIME OF OBS	

FORECAST	
DESTINATION (ETA)	
ALTERNATE (ETE)	

ROUTE FORECAST

MIN CIG 5000 AT 5	MAX CLD TOPS FT MSL	THUNDERSTORMS	TURBC	HAIL
MIN VIS FLT LVL	DUST OR HAZE	SMOKE	RAIN	FOG
MIN FRZ LVL FT MSL	ICING	FRZ PCPN	SNOW	BRIEFING VOID AFTER
WINDS			SIGNATURE	

E. FLIGHT CLEARANCE AUTHORIZATION

SUBMITTED TO	TIME	BY	SIGNATURE OF CLEARING AUTHORITY
INSTRUCTIONS AND APPROVAL TRANS. TO TOWER OR PILOT BY		ACTUAL T.O. TIME	A-H
STATION ARRIVED AT	TIME	NAME	GRADE OR POSITION

DD FORM 1 MAY 54 175 PREVIOUS EDITIONS OF THIS FORM MAY BE USED.

16—70801-1 U. S. GOVERNMENT PRINTING OFFICE

Just in case you've forgotten what the old DD Form 175 looked like.

MAINTENANCE SPOT CHECK INSPECTION FOR ARMY AIRCRAFT

(SR 750-705-10)

See Reverse Side for Instructions

ORGANIZATION	LOCATION	DATE
57th Trans Co (Lt Hel)	Fort Riley, Kansas	6 Sep 57

AIRCRAFT SERIES	TOTAL HOURS: AIRCRAFT	TOTAL HOURS: ENGINE 1.	TOTAL HOURS: ENGINE 2.	AIRCRAFT SERIAL NUMBER	ENGINE SERIAL NUMBER 1.	ENGINE SERIAL NUMBER 2.
H-21C	74:40	74:40		56-2063	BL519657	

LEGEND FOR MARKING

✱ - SATISFACTORY | X - IMPROPER ENTRY OR NON-COMPLIANCE | XX - ADJUSTMENT OR REPAIR REQUIRED | XXX - REPLACEMENT REQUIRED

INSPECTION GROUPS

1. ENGINE	LEGEND	2. WING - ROTOR	LEGEND	3. FUSELAGE	LEGEND
a. FUEL SYSTEM	XX	a. FUEL SYSTEM & TANKS	✱	a. FUEL SYSTEM & TANKS	✱
b. OIL SYSTEM & TANKS	XXX	b. HYDRAULIC SYSTEM	✱	b. HYDRAULIC SYSTEM	✱
c. IGNITION & ELECTRICAL SYSTEM	✱	c. ELECTRICAL SYSTEM	✱	c. ELECTRICAL SYSTEM	✱
d. EXHAUST STACKS OR MANIFOLD	✱	d. FLIGHT-CONTROL MECHANISMS	XX	d. CONTROL MECHANISMS	✱
e. COOLING SYSTEM	✱	e. FIXED SURFACES	✱	e. FUSELAGE STRUCTURE (incl tail boom)	✱
f. ENGINE CONTROLS	✱	f. MOVABLE SURFACES	✱	f. FABRIC OR SKIN	✱
g. POWER PLANT - GENERAL	✱	g. EXTERNAL BRACING	✱	g. EXTERNAL BRACING	✱
h. HEATING & VENTILATING SYSTEM	✱	h. WING ATTACH FITTINGS	✱	h. DOORS, WINDOWS & EMERGENCY EXITS	✱
i. ENGINE MOUNT & ATTACH FITTINGS	✱	i. ANTI-ICING DEVICES	N/A	i. CARGO COMPARTMENTS	✱
j. ENGINE ACCESSORIES	XX	j. GUST LOCK MECHANISM	N/A	j. BATTERIES	✱
k. ENGINE COWLING	XX	k. MAIN ROTOR BLADES	✱	k. CARGO & LITTER EQUIPMENT	✱
l. ROTOR TRANSMISSION & SHAFTS	✱	l. ROTOR HUBS	✱	l. ROTOR SHAFTS & TRANSMISSIONS	✱
m. OIL DILUTION SYSTEM	✱	m. WALKWAYS, STEPS, ETC	✱	m. LUBRICATION	✱
n. LUBRICATION	✱	n. LUBRICATION	✱	n. PAINT, MARKING & INSIGNIA	✱
o. PAINT, MARKING & INSIGNIA	✱	o. PAINT, MARKING & INSIGNIA	✱	o. Control Transmission	XX
p. AIR FILTER	✱	p.		p. Clutch Actuator	XX
q.		q.		q.	
r.		r.		r.	
s.		s.		s.	

4. EMPENNAGE	LEGEND	5. PROPELLER	LEGEND	6. LANDING GEAR	LEGEND
a. HYDRAULIC SYSTEM	✱	a. PROPELLER BLADES	N/A	a. HYDRAULIC SYSTEM	✱
b. ELECTRICAL SYSTEM	✱	b. PROPELLER HUB(S)	N/A	b. ELECTRICAL SYSTEM	✱
c. FLIGHT-CONTROL MECHANISMS	✱	c. CONTROL MECHANISM	N/A	c. MAIN LANDING GEAR	✱
d. FIXED SURFACES	✱	d. ATTACHMENT	N/A	d. TAIL OR NOSE GEAR	✱
e. MOVABLE SURFACES	✱	e. ACCESSORIES	N/A	e. LATCHES OR LOCKS	✱
f. EXTERNAL BRACING	✱	f. ANTI-ICING DEVICES	N/A	f. RETRACTING MECHANISM	✱
g. ATTACH FITTINGS	✱	g. BODY, ETC	N/A	g. LANDING GEAR DOORS & LINKAGE	N/A
h. ANTI-ICING DEVICES	N/A	h.		h. LANDING GEAR ATTACH FITTINGS	✱
i. GUST LOCK MECHANISM	N/A	i.		i. WHEELS, BRAKES & TIRES	✱
j. TAIL ROTOR BLADES	N/A	j.		j. STRUTS & ATTACH FITTINGS	✱
k. LUBRICATION	✱	k.		k. FLOATS & ATTACH FITTINGS	✱
l. PAINT, MARKING & INSIGNIA	✱	l.		l. SKIS & ATTACH FITTINGS	N/A
m.		m.		m. SKID OR GUARD	N/A
n.		n.		n. LUBRICATION	✱
o.		o.		o.	
p.		p.		p.	
q.		q.		q.	
r.		r.		r.	

DA FORM 1 SEP 55-12

7. CABIN-COCKPIT	LEGEND	8. RADIO	LEGEND	9. MISCELLANEOUS	LEGEND
a. FUEL SYSTEM & TANKS	✱	a. RECEIVER & HEADSETS	✱	a. PROPER EXECUTION OF USAF FORMS 1, ~~781 Series~~ 829 Series	X
b. OIL SYSTEM	✱	b. TRANSMITTER & MICROPHONE	✱	b. COMPLIANCE WITH REQUIRED USAF TECHNICAL ORDERS	✱
c. HYDRAULIC SYSTEM	✱	c. ANTENNAS & INSULATORS	✱	c. CHECK EQUIPMENT PRESENT IN AIRCRAFT AS SHOWN IN USAF FORM 26)	✱
d. ELECTRICAL SYSTEM	✱	d. BONDING & SHIELDING	✱	d. REQUIRED TECHNICAL PUBLICATIONS IN AIRCRAFT PER T.O. 01-1-10	✱
e. FLIGHT & ENGINE CONTROLS	✱	e. ADF RECEIVER & LOOPS	✱	e. UNAUTHORIZED MODIFICATIONS	✱
f. INSTRUMENTS	✱	f. DYNAMOTOR	✱	f. SUBMITTAL OF MR'S PER AR 700-38	✱
g. HEATING & VENTILATING SYSTEM	✱	g. AUXILIARY POWER UNIT	N/A	g.	
h. DOORS & WINDOWS	✱	h. ELECTRONIC DEVICES	✱	h.	
i. WINDSHIELD OR INCLOSURE	✱	i. INVERTER	✱	i.	
j. BATTERIES	✱	j. CONTROL UNITS	✱	j.	
k. SEATS	✱	k. WIRING HARNESS	✱	k.	
l. SAFETY BELTS & SHOULDER HARNESSES	✱	l.			
m. FIRE-WARNING SYSTEM	✱	m.			
n. FIRE EXTINGUISHER SYSTEM	✱	n.			
o. EMERGENCY EQUIPMENT	✱	o.			
p. LUBRICATION	✱	p.			
q.		q.			
r.		r.			
s.		s.			
t.		t.			

REMARKS

See Attached Sheet

Aircraft Rating Good

SENIOR INSPECTOR	GRADE OR TITLE	INSPECTION PERFORMED BY	GRADE OR TITLE
HERMAN M. ORRELL III	1st LT	Billy R. Henderson	SP-2

INSTRUCTIONS

1. The purpose of this form is to guide inspection parties in determining the character of the maintenance which has been performed on an aircraft without resorting to disassembly of components of the aircraft. (AR 750-5 and SR 750-705-10)

2. These inspection requirements are indicated in general terms to allow the adaptation of this form to all types of army aircraft.

3. In each block there are blank spaces provided for listing any additional items which are not in satisfactory condition.

4. Line thru items which are not applicable to the aircraft being inspected.

5. The block or group number does not necessarily indicate the order of importance or sequence of inspection but are so arranged as to save space.

6. Refer to Technical Orders for detailed inspection procedures on specific aircraft.

7. Select at least three (3) additional items for each of the groups listed above from Technical Orders for aircraft being inspected.

8. Recommendations for the addition, deletion or change to any item listed hereon should be forwarded to Office of the Chief of Transportation, Washington 25, D. C., ATTN: TCATS-H.

U.S. GOVERNMENT PRINTING OFFICE : 1954 O - 314000

We can see here that maintenance got off to a good start and while 063 required a few adjustments and remove and replacements at the ripe old age of 74:40, it was still noted to be in "good" condition. One wonders where she went since that tail number went off the books a short time later.

And this Issue Slip indicates that the boss wanted the area policed up by Oct 57.

ISSUE SLIP

PAGE 1 OF 1 PAGES

FROM: BASE OR STATION ACCOUNTABLE OFFICER
BASE PROPERTY
SCHILLING AIR FORCE BASE
SALINA, KANSAS

TO: ORGANIZATION OR UNIT
57th Trans Co (Lt Heptr)
Fort Riley,
Kansas

ISSUE SLIP NO. | PROPERTY | PROPERTY CLASS | TYPE OF ISSUE | INITIAL | REPLACEMENT | MEMO RECEIPT | ACCOUNT SYMBOL | WORK ORDER NO.

ITEM NO.	STOCK OR PART NO.	NOMENCLATURE	AUTH. ALLOW.	ON HAND AND DUE IN	UNIT	QUANTITY REQUESTED	UNIT COST	TOTAL COST	ACTION
1.		Hand Tools							
2.		Paint							
3.		Hardware							
4.		Aluminum							
5.		Radio Equipment							
		/x/x/x/x/x/x/x/x/x/x/x/x/x/LAST ITEM/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/x/							
6.									

AUTHORITY

ISSUANCE OF QUANTITY IN "QUANTITY REQUESTED" COLUMN IS AUTHORIZED. ITEMS MARKED "DUE OUT" WILL BE ORDERED AND WHEN RECEIVED ORGANIZATION WILL BE NOTIFIED.

(DATE) (FOR THE BASE OR STATION ACCOUNTABLE OFFICER)

QUANTITIES SHOWN IN "ACTION" COLUMN HAVE BEEN ISSUED:

(DATE) (SIGNATURE)

FOR THE COMMANDING OFFICER:

Maurice C. Bone
17 Oct 1957 (DATE) MAURICE C BONE MAJOR TC (ORGANIZATION SUPPLY OFFICER)

QUANTITIES SHOWN IN "ACTION" COLUMN HAVE BEEN RECEIVED:

(DATE) (AUTHORIZED REPRESENTATIVE)

VOUCHER NO.

DA FORM 1 APR 48 446 (Formerly DA 400) EDITION OF 1 MAR 47 MAY BE USED

U. S. GOVERNMENT PRINTING OFFICE

The field training started quickly.

57TH TRANSPORTATION COMPANY (LT HEL)(H-21)
Fort Riley, Kansas

SUBJECT: Field Exercise for 57th Transportation Company and 98th Transportation Detachment 16 December 1957 through 19 December 1957

SECTION I GENERAL

A. PERSONNEL AND EQUIPMENT: Full TO&E except personnel necessary for fire guards to remain in Company area.

B. CONCEPT: Exercise will be conducted in three phases as follows:
1. Movement to field on 16 December 1957 and 18 December 1957.
2. Occupation and organization of landing site and bivouac area.
3. Operational missions movement of troops to include:
a. Movement of combat elements of an Infantry Company.
b. Evacuation of wounded.
c. Movement of approximately 35 tons of cargo. (Internal and external methods to be employed).
d. Night cargo mission (Platoon size).
e. Air attack on Helicopters while employed on mission, either a, b, or c above.
f. Ground attack on bivouac area.
g. Gas attack on bivouac area.

C. ADMINISTRATIVE INSTRUCTIONS:
1. Participating troops:
a. 57th Transportation Company (Lt Hel)(H-21).
b. 98th Transportation Detachment (CHFM).
c. Combat elements of Infantry Company.
d. Agressor force (to be simulated).
2. Maps: Maps, charts and aerial photos to be furnished by operations.
3. Scheduling:
a. Phase I begins at the start of training day.
b. Phase II to be completed within two hours after closing into bivouac area or by darkness of 1st day which ever is sooner.
c. Phase III to begin on order after completing phase II, must be accomplished prior to ending of exercise.
d. Problem to begin at the start of training day and end at 1200 hours the following day.
4. Equipment:
a. Troops to be combat equipped.
b. Full TO&E equipment.
5. Supply: Classes I, III, IV and V supply to be played throughout the exercise.
6. Maintenance-Continous.
7. Medical Evacuation-Simulated casualties during all phases.
8. Communication-As provided for in Unit SOP.
9. Mail-To be picked up and delivered in the field.
10. Mess-To be prepared in the field.
11. Ammunition-To be simulated by supply section.

SECTION II

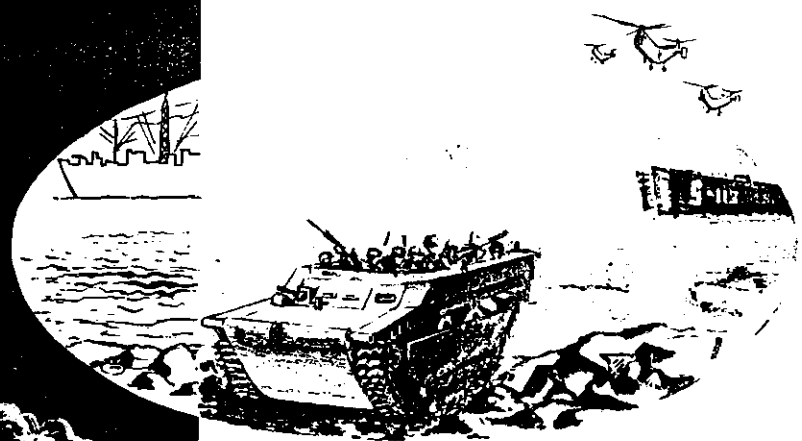
PHASE I DISPLACEMENT

A. GENERAL

Carell
16 Sep 1958

ARMY-NAVY AMPHIBIOUS
EXERCISE CALIFORNIA 1958

ROCKY SHOALS



ADMINISTRATIVE
INSTRUCTIONS

Orrell
27 June 1958

final report

Exercise

INDIAN RIVER

YAKIMA FIRING CENTER

Washington

FOR OFFICIAL USE ONLY

The move to Ft. Lewis was ordered in January 1958 and as mentioned in Dick's letter, it was not without incident. The assumption that I would remember certain events is, like many assumptions, not true, but perhaps some of you will remember Rocky Shoals and Mountain Road. Exercise Indian River introduced us to the Yakima firing range with the 4th Division.

20 J

98TH TRANSPORTATION DETACHMENT (CHPM)

NAME	RANK
ORRELL, Herman M III	Capt
BROWN, Franklin H	WOW1
BAKER, Louis	Pfc
BLAKEMAN, Cornelius E M	Sgt
BRIGGS, Jerome C	Pfc
BURLESON, Johnnie D	Pfc
CARPENTER, Garry D	Sfc
DEMKO, Michael	Pfc
ELKINS, Keith M	Pvt2
EMOND, David A	Sp3
ERICKSON, Phillip A	Pfc
FABIAN, Joseph M	Sgt
FERGUSON, Charlie A	Pfc
GORDON, Charles M	Pfc
GRAHAM, Gary L	MSgt
GRIFFIN, Thomas R	Pfc
GROSS, Carl W	Pfc
HARDISON, John W	Sp2
HATHCOCK, Tommy R	Pfc
HEBERER, Louis H	Pfc
HOAG, Donald W	Sp3
HOBG, Gene L	Spl
JACK, Roy	Sp2
KAHRL, William B	Sp2
KAUFFMAN, Billy E	Sp3
KELLEY, Dalton P	Pfc
KLAUS, Billy D	Sp3
KNOEPFEL, William D J	Pfc
LYNCH, Terrence T	Pfc
MADSEN, Arnold L	Pfc
MANNING, Duncan A	Pfc
MATHEWS, Roger D	Sp3
MOTHER, Charles J	Pfc
PIGG, Glendel W	Pfc
RILEY, Lawrence R	Pfc
ROSDAHL, Kenneth L	Pfc
RUCKER, Lewis	Pfc
SCHULTZ, Eugene W	Sfc
SPINARDI, Theodore J	Pfc
SQUIEd, Morris W	Pfc
STEVENSON, Robert L	Sp3
TILLEY, Halcum G	
WAGNER, Donald K	

ANNEX A - Roster Personnel, Movement Order Number 1 — 20 JAN 1958

57TH TRANSPORTATION COMPANY (LT HEL)(H-21)

NAME	RANK
BONE, Maurice C	Major
JACKSON, Walter W	Capt
BRIGGS, Roy E Jr	1 Lt
FRALICK, Lawrence R	1 Lt
KINNEY, Arthur K Jr	1 Lt
MARKLEY, Laighton O	1 Lt
BEATTY, William R	CWO2
CRICH, Jack M	CWO2
HILEMAN, Blair R	CWO2
HUNGERFORD, Charles F	CWO2
AUTREY, Martin L	WOW1
CAIN, James F	WOW1
CRAWFORD, George W	WOW1
CUMMINGS, Leonard W	WOW1
CUSTIS, Warren L	WOW1
DOBLADO, Edmundo M	WOW1
FLYNN, Callum J	WOW1
GRIGGS, John L Jr	WOW1
JONES, Clarence T	WOW1
KELLY, Lawrence D Jr	WOW1
KISTLER, Marvin	WOW1
KOEHLER, Walter H	WOW1
LOMBARDO, Lawrence	WOW1
MANUEL, Webster C	WOW1
O'SHEA, James P	WOW1
PACKARD, Linwood N	WOW1
PAUL, Delbert A	WOW1
REYES, Joaquin R	WOW1
RICE, Daniel J	WOW1
SIGLER, Billie M	WOW1
SINQUEFIELD, James T	WOW1
SMALL, Stanley C	WOW1
SMITH, Ronald I	WOW1
SOTOMAYOR, Cesar A	WOW1
STROUD, Richard L	WOW1
SULLIVAN, Ralph	WOW1
VERTREES, Carl R	WOW1
WESTBROCK, Wiley K	WOW1
WILHITE, Charley R	WOW1
WILLIAMS, William Jr	WOW1
ANTLE, Donald W	SP2
BARKER, Dale	SGT
BARMORE, Thomas B	SGT
BOLDUC, Paul J	PVT2
BOHLEY, Donald D	PVT2

Movement Order Nr 26, dtd 13 Dec 1957, was the last of series for 1957

HEADQUARTERS FORT RILEY
Fort Riley, Kansas

AIRGC-O 370.5

SUBJECT: Movement Order Number 1 — 20 JAN 1958

TO: See Distribution

1. Authority: Letter, AG 370.5 AIFGC-PO, Headquarters Fifth US Army, 3 December 1957, subject: "Movement Directive - 57th Transportation Company (Helicopter)(H-21) and 98th Transportation Detachment (Cargo Helicopter Field Maintenance) to Fort Lewis, Washington".

2. a. Move the units listed below from Fort Riley, Kansas, to Fort Lewis, Washington.

UNIT	TOE	AUTHORIZED STRENGTH OFF	WO	NCO	EM	DEPARTURE DATE
57th Trans Co (Lt Hel (H-21)	55-57C 1956	12	34	9	92	c/a 17 Feb 1958
98th Trans Det (CHPM)	55-500R, 1955	1	1	2	31	c/a 17 Feb 1958
Adv Det (57th Trans Co and 98th Trans Det (CHPM))		(1)	(2)		(6)	c/a 10 Feb 1958

b. Units will move at current strength.

c. This is a PERMANENT CHANGE OF STATION.

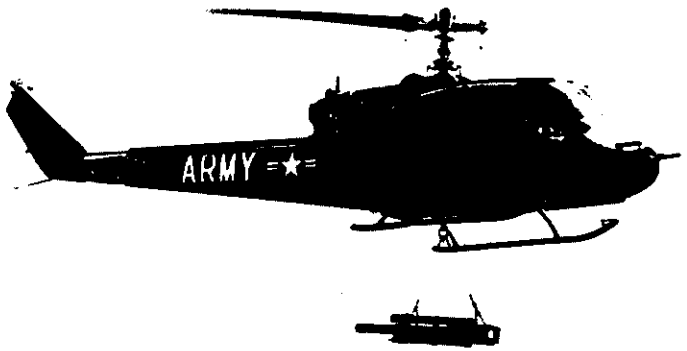
d. Units are assigned Fifth US Army. Upon completion of move units will be assigned Sixth US Army.

3. Movement Data:

a. Travel by TR, government, and organic transportation is directed, except for those individuals listed in Annex B whose presence is not required for proper execution of move and who are authorized to travel separately from Fort Riley, Kansas, to Fort Lewis, Washington. SR 55-720-2 and Memorandum 58-3, Headquarters Fifth US Army, apply.

FORT LEWIS

Operations at Ft. Lewis were in support of maneuvers and training for the 4th Infantry Division.



By 1960 the brand new HU-1 "Huey" was working with us in small numbers. A favorite CH-21C IP training trick was a rapid accel/decel-to-a-hover over those single pine trees that dotted the Nisqually flats at Ft. Lewis.

57TH TRANSPORTATION COMPANY (LT HEL)(H-21)
Fort Lewis, Washington

ORDERS
NUMBER 55

7 September 1960

1. VOCO 1 Aug 60 cfm as fol: 1ST LT VERNON W WOODWARD 05202929 TC, is dsg add dy as Troop Information Off, Education Off, Altn Utility Off, and Altn Conservation Off for this unit and 98th Trans Det (CHFM).

2. VOCO 1 Aug 60 cfm as fol: CWO W-2 LAWRENCE LOMBARDO W3150404 USA (TC), is dsg add dy as Communication Off, Asst KL-7 Custodian, Asst Entertainment Off, Altn Security Off, Altn Censor Off, Altn Custodian, Classified Docu, and Asst USAF Stamp Custodian for this unit and 98th Trans Det (CHFM).

3. VOCO 1 Aug 60 cfm as fol: CWO W-2 CARL R VERTREES W3150361 USA (TC), is dsg add dy as Unit Mess Off, this unit and Asst Training Off for this unit and 98th Trans Det (CHFM).

4. VOCO 1 Aug 60 cfm as fol: 1ST LT WILLIAM H BRETHOUR 05505887 TC, is dsg add dy as Motor Trans Off for this unit and 98th Trans Det (CHFM).

5. VOCO 1 Aug 60 cfm as fol: CAPT MILTON P CHERNE 01688819 TC, is dsg add dy as Re-enlistment Officer.

6. VOCO 1 Aug 60 cfm as fol: 1ST LT DAVID C SENAY 070867 TC, is dsg add dy as Asst STRAC Control Off, Unit Historian, Voting Off, Income Tax Off, and Personal Affairs Off for this unit and 98th Trans Det (CHFM).

7. VOCO 1 Aug 60 cfm as fol: WO W-1 PAUL H GOTNER W3150749 USA (TC), is dsg add dy as Unit Fund Recorder, Asst Troop Information Off, Asst Education Off and Asst Intelligence Off for this unit and 98th Trans Det (CHFM).

8. VOCO 1 Aug 60 cfm as fol: CWO W-2 CHARLEY R WILHITE W3150416 USA (TC), is dsg add dy as Bonds Off, Savings Off, Asst Avn Safety Off, Asst Weight and Balance Technician and Unit Safety Off for this unit and 98th Trans Det (CHFM).

9. VOCO 1 Aug 60 cfm as fol: 1ST LT EMMETT P WRIGHT 081469 TC, is dsg add dy as Altn CBR Off for this unit and 98th Trans Det (CHFM).

10. VOCO 1 Sep 60 cfm as fol: 2D LT SALVATORE R FORMIDA 05006416 TC, is apt prin dy as Rotary Wing Aviator, 2d Sec, 2d Plat and further dsg add dy as KL-7 Custodian, Altn Communication Off, Asst PIO, and Asst Insurance Off for this unit and 98th Trans Det (CHFM).

11. VOCO 1 Aug 60 cfm as fol: CWO W-2 CHARLES F HUNGERFORD W2205351 USA (TC), is dsg add dy as Asst Motor Transportation Off for this unit and 98th Trans Det (CHFM).

---

12. VOCO 1 Aug 60 cfm as fol: CAPT FORREST L JORGENSON 01929214 TC, is dsg add dy as Entertainment Off for this unit and 98th Trans Det (CHFM).

13. VOCO 1 Aug 60 cfm as fol: CWO W-2 JAMES R EAKINS W3150389 USA (TC), is dsg add dy as Asst Svc Plat Commander.

14. VOCO 1 Aug 60 cfm as fol: CWO W-2 LEONARD R WILSON W2207625 USA (TC), is dsg add dy as Unit Safety Off for this unit and 98th Trans Det (CHFM).

15. VOCO 5 Aug 60 cfm as fol: 1ST LT JOHN W SMITH 04069591 TC, is dsg add dy as Altn Fire Marshal for this unit and 98th Trans Det (CHFM).

16. SMOP 3 Orders 51 this Hq as pert to 1ST LT JOHN W SMITH 04069591 TC. as reads: 1 Aug 60, ETR: 5 Aug 60.

MILTON P. CHERNE
Captain, TC
Commanding

Orders were published for:
— Every imaginable additional duty.

57TH TRANSPORTATION COMPANY (LT HEL)(H-21C)
Fort Lewis, Washington

ORDERS
NUMBER 37

25 June 1960

1. VOCO 15 Jun 60 cfm as fol: CAPT LEON W CURRY 02262580 TC is apt prin dy as Operations Officer vice CAPT MILTON P CHERNE 01688819 TC.

2. VOCO 15 Jun 60 cfm as fol: 1ST LT FORREST L JORGENSON 01929-814 TC is apt prin dy as Platoon Commander, 1st Plat vice CAPT LEON W CURRY 02262580 TC.

3. VOCO 15 Jun 60 cfm as fol: 1ST LT EMMETT P KNIGHT 081469 TC is apt prin dy as Asst Platoon Commander, 1st Platoon.

4. VOCO 15 Jun 60 cfm as fol: 1ST DAVID C SENAY 071867 TC is apt prin dy as Flight Leader, 1st Section, 1st Platoon.

5. VOCO 15 Jun 60 cfm as fol: 2D LT WILLIAM H BRETHOUR 05505887 TC is apt prin dy as Flight Leader, 2d Section, 1st Platoon vice 2D LT RICHARD J OLSEN 05507430 TC.

6. VOCO 15 Jun 60 cfm as fol: 1ST LT KENNETH L KLIPPEL 077071 TC is apt prin dy as Platoon Commander, 2d Plat vice CAPT ARTHUR K KINTZY JT 02028711 TC.

7. VOCO 15 Jun 60 cfm as fol: 1ST LT LEIGHTON O MARKLEY 02087473 TC is apt prin dy as Asst Platoon Commander, 2d Platoon.

8. VOCO 15 Jun 60 cfm as fol: 1ST LT HENRY B LUDLUM 077889 TC is apt prin dy as Flight Leader, 1st Section, 2d Platoon vice 1ST LT LEIGHTON O MARKLEY 02087473 TC. (For planning purposes only).

9. VOCO 15 Jun 60 cfm as fol: 2D LT RICHARD J OLSEN 05507430 TC is apt prin dy as Flight Leader, 2d Section, 2d Platoon vice CWO W-2 JACK M GRIDH RW2153906 USA (TC).

10. VOCO 15 Jun 60 cfm as fol: CAPT JAMES R HARRIS 01820965 TC is apt prin dy as Service Platoon Commander.

11. Par 1 Orders Nr 69 this hq (59 series) designating CAPT JAMES R HARRIS 01820965 TC as Maintenance Officer, is rescinded.

MILTON P. CHERNE
Captain, TC
Commanding

— For the big jobs.

57TH TRANSPORTATION COMPANY (LT HEL)(H-21)
Fort Lewis, Washington

ORDERS
NUMBER 51

6 August 1960

1. WOCO 1 Aug 60 cfn as fol: 1ST LT WILLIAM H HINDS 05203982 TC, Rotary Wing Aviator, is dsg add dy as Admin Off, Rec Mgt Off, Forms Con Off, and Asst Postal Off for the 57th Trans Co (Lt Hel) (H-21) and 98th Trans Det (CHPM), and is authorized to sgn offl corr for the commander.

2. WOCO 1 Aug 60 cfn as fol: 1ST LT EMMETT F KNIGHT 0614[illegible] TC Asst Plat Commander, 1st Plat is dsg add dy as STRAC Con Off, Trng Off, Intel Off, PIO, Insurance Off, and Asst Claims Off for the 57th Trans Co (Lt Hel)(H-21) and 98th Trans Det (CHPM).

3. WOCO 1 Aug 60 cfn as fol: 1ST LT JOHN W SMITH 04069591 TC Flt Ldr, 2nd Sec, 1st Plat is dsg add dy as Claims Off, Asst Admin Off, Asst Rec Mgt Off, Asst Forms Con and Asst Fire Marshall for the 57th Trans Co (Lt Hel)(H-21) and 98th Trans Det (CHPM).

4. WOCO 1 Aug 60 cfn as fol: 1ST LT RICHARD J OLSEN 05507430 TC Flt Ldr, 2nd Sec, 2nd Plat, is dsg add dy as Postal Off, Censor Off, Weight and Balance Tech, S & R Off, USAF Stamp Custodian and Asst Savings and Bonds Off for the 57th Trans Co (Lt Hel)(H-21) and 98th Trans Det (CHPM).

5. WOCO 1 Aug 60 cfn as fol: CWO W-2 ROBERT M. ZEIGLER RW3150257 USA TC, Rotary Wing Aviator, is dsg add dy as Security Off and Custodian, Classified Documents for the 57th Trans Co (Lt Hel) (H-21) and 98th Trans Det (CHPM).

6. WOCO 1 Aug 60 cfn as fol: CWO W-2 JAMES A CRABTREE W3150609 USA TC, is dsg add dy as Asst Arms Off for the 57th Trans Co (Lt Hel) (H-21) and 98th Trans Det (CHPM).

7. WOCO 1 Aug 60 cfn as fol: CWO W-2 JAMES A CRABTREE W3150609 USA TC, Rotary Wing Avaitor, is dsg add dy as Unit Sup and Property Book Off Organizational Book Nr 6-18-4 and Station Book 6-18-8

8. WOCO 1 Aug 60 cfn as fol: WO W1 WARREN D. TINSETH W3150767 USA TC, Rotary Wing Aviator is dsg add dy as Arms Off for the 57th Trans Co (Lt Hel)(H-21) and 98th Trans Det (CHPM); Asst Unit Sup and Property Book Off Organizational Book Nr 6-18-4 and Station Book 6-18-8.

9. WOCO 1 Aug 60 cfn as fol: CWO W2 WALTER H. HOEHLER W3150439 USA TC, Rotary Wing Aviator, is dsg add dy as Asst Operations Off and Asst Mess Off.

10. Par 3 O 90 this hq as apt 1ST LT WILLIAM H BRETHOUR 05505887 TC prin dy as Rotary Wing Aviator is revo.

11. WOCO 27 Jun 60 cfn as fol: PRMD this unit SM Comp and Hr Svc inds, are apt prin dy as Rotary Wing Aviators, 2d Sec, 2d Plat:

GRADE	NAME	SN	COMP/BR SVC
CWO W-2	CLARENCE T JONES	W3150437	USA TC
CWO W-2	MARTIN L AUTRY	W3150364	USA TC
CWO W-2	LEONARD R WILSON	W2207625	USA TC
CWO W-2	CHARLEY R WILHITE	W3150416	USA TC

12. WOCO 1 Aug 60 cfn as fol: CWO W-2 LEONARD R WILSON W2207625 USA TC, Rotary Wing Aviator, is apt add dy as Avn Safety Officer for the 57th Trans Co (Lt Hel)(H-21) and 98th Trans Det (CHPM).

13. WOCO 1 Aug 60 cfn as fol: CWO W-2 ASA ELLETT W3150646 USA TC, Rotary Wing Aviator, is dsg add dy as Survival Equip Off, CBR Off and Asst A/F Svc and POL Off for the 57th Trans Co (Lt Hel) (H-21) and 98th Trans Det (CHPM).

14. WOCO1 Aug 60 cfn as fol: CWO W-2 RICHARD L STROUD W3150376 USA TC, Rotary Wing Aviator, is dsg add dy as A/F Svc and POL Off, Asst A & R Off for the 57th Trans Co (Lt Hel)(H-21) and 98th Trans Det (CHPM).

— And the Strategic Army Corps.

HEADQUARTERS 4TH INFANTRY DIVISION TRAINS
Fort Lewis, Washington

SPECIAL ORDERS
NUMBER 113

E-X-T-R-A-C-T

9 September 1960

1. PAO AR 370-5 FTO 3 EM 57th Trans Co (LT HEL)(H-21) 4th Inf Div this sta having fired KD Range for rec on 25 Aug 60 w/Cal .45 Pistol are qual as indc and awarded Qual Badge w/Comp IAW AR 600-70:

EXPERT

GRADE AND NAME		SN	SCORE
1ST LT	WILLIAM H HINDS	05203982	281
CAPT	KENNETH L KLIPPEL	077071	264
CWO W-2	LEONARD R WILSON	W2207625	284
WO W-1	PAUL H COTNER	W3150740	323
SP4 (E-4)	DANIEL M DEVLIN	RA11211612	286

SHARPSHOOTER

CAPT	FORREST L JORGENSEN	01929814	272
1ST LT	HENRY B LUDLUM	077689	279
1ST LT	WILLIAM C RUDD	04033975	269
CWO W-2	ASA ELLETT	W3150646	254
CWO W-2	CLARENCE T JONES	W3150437	253
CWO W-2	ROBERT M ZEIGLER	RW3150257	254
WO W-1	WARREN D TINSETH	W3150767	276
SP6 (E-6)	DONALD W CLINE	RA19361171	278
SP6 (E-6)	LEROY F REED	RA38692621	262
SP6 (E-6)	ARTHUR J THOMPSON	RA16472338	257
SP5 (E-5)	CHARLES RAMSTETTER	RA17450450	259

MARKSMAN

CAPT	MILTON P CHERNE	01688819	241
1ST LT	WILLIAM H BRETHOUR	05505887	241
1ST LT	EMMETT F KNIGHT	0614[illegible]	225
1ST LT	RICHARD L OLSEN	05507430	233
1ST LT	DAVID C SENAY	071867	212
CWO W-2	JAMES A CRABTREE	W3150609	218
CWO W-2	JAMES R EAKINS	W3150389	212
CWO W-2	CHARLES J HENDRICKSON	W2206109	238
CWO W-2	CHARLES E LARKIN	W2206468	243
CWO W-2	LAWRENCE LOMBARDO	W3150404	238
CWO W-2	RONALD I SMITH	W3150451	226
CWO W-2	RICHARD L STROUD	W3150376	238
CWO W-2	ROBERT P SWORD	W2206104	215
CWO W-2	CARL R VERTREES	W3150361	222
CWO W-2	CHARLEY R WILHITE	W3150416	243

— To prove we could shoot or throw the .45 cal. pistol.

The 57th goes from STRAF 8 to STRAC 2 and Cpt. Milt Cherne, XO, promises Cpt. Bill Rudd, Maint O, ... "If you ever get them all flying at once, I'll wear my dress blues to work." It happened 29 Mar 1961 at Grey Field Ft. Lewis, WA.

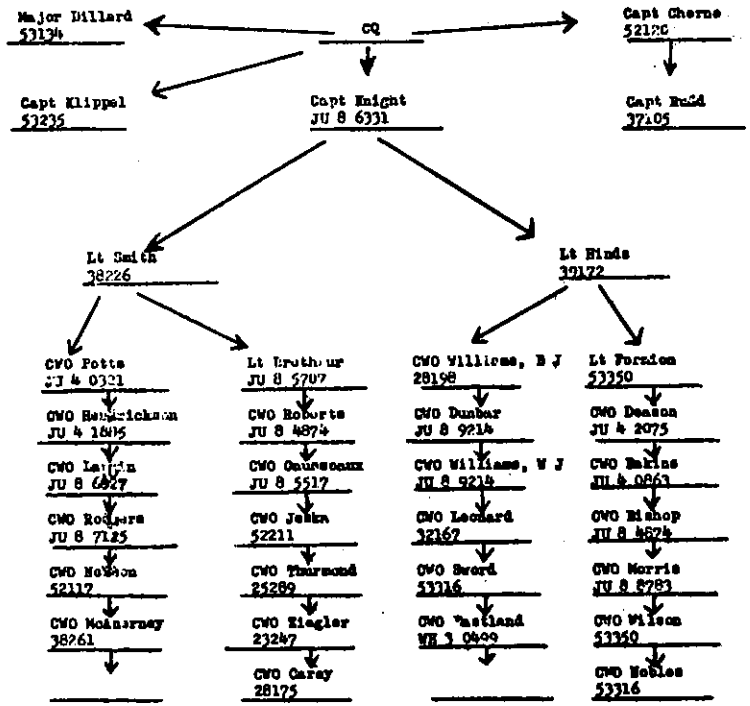
Others: CWO Clarence Nobles, Ass't Maint O 98th Trans Det, Maj. Bob Dillard, CO, Cpt. Ken Klippel, CO 98th Det, Cpt. Leon Curry, Opns O.

That same day, 29 Mar 61, we rattled the windows at post headquarters and we did it again in November with 20 flyables as we departed station for station, California and onward to Vietnam ... much to the amazement of the 4th Infantry Division. Another "first" was that all 20 of them got there with only one minor maintenance problem. One ship suffered an inoperative auxiliary fuel pump.

EXERCISES

STRAC alert notification charts were published.

OFFICERS' ALERT NOTIFICATION PLAN



Call following arms if no answer call next individual in chain.

ALERTS

Category — Action

1. Muster in duty uniform, check, of ID cards and tags, shot records, and glasses.
2. Muster and showdown of clothing and equipment. Uniform same as # 1.
3. Muster. Load clothing and equipment. Move to field for 72 hours. Uniform: Field uniform as prescribed boots, combat pack, weapon, steel helmet, and web equipment.
4. Muster. Pack and load individual and unit iquipment. Prepare for POS rail movement. Duration: 72Hours. Uniform: Same as 1.
5. Same as 4 except duration is 96 hours. Personnel and equipment are loaded on trains.

CHECK LIST

1. Individuals
   a. ID Tags
   b. ID Cards
   c. Immunization records
   d. Glasses
   e. Clothing and equipment & toilet articles
   f. Change of address card
   g. Disposition of personal property.
2. Unit:
   a. Personal Affairs orientation.
   B. Will and power of attorney.
   c. Class "E" allotment
   d. Escape and evasion lecture
   e. Orientation of missing movement. AWOL and desertion articles
   f. Insurance
   g. DD 93 (Notification of next of kin)
   h. Partial pay
3. Rumors are deadly

REMAIN SILENT AND LIVE

The 1st Platoon gathers at Yakima in 1961. The mustaches are proof of a recent or on-going field exercise. The readable nametags identify the relative newcomers to the platoon. CWO's, Asa Elliot and Huey Nelson, are the old timers. Bob Ziegler is in the back.

INSTRUCTIONS FOR PASSENGERS
IN ARMY AIRCRAFT

If you will kindly observe the following rules, it will be a "hell-of-a-lot" easier and more comfortable for the crew. After all, whose chopper is it anyway?

1. Keep your goddam feet off the seats.
2. Don't get snotty with the crew. Remember your pilot is still learning to fly and is more scared than you.
3. If a fellow passenger becomes too nervous, belt him over the head with an empty booze bottle. (Pass the full ones forward to the pilots compartment, they will furnish you an empty one).
4. Keep your goddam feet off the seats.
5. If the pilots get into a fight over who's to fly the chopper, do not interfere. GI insurance does not cover fist fights of passengers.
6. Leave each crew member a healthy tip.
7. Do not ask embarrassing questions, such as; "Who made that landing?", "When are we going to land?", "Where are we?" etc.
8. Keep your goddam feet off the seats.
9. If you don't like the noise, you can go plumb to hell.
10. Only one person allowed to use the relief tube at any one time, and then only when one of the crew is not using it.
11. Do not touch first aid kits. These are for use by crew members only.
12. Keep your goddam feet off the seats.
13. Stay out of the crews crap game, its strictly private.
14. Always let the crew leave first, after all the dam chopper may be on fire.
15. Do not leave the chopper in a wild-eyed, screaming, clawing rush; it may have an adverse affect on new passengers about to board the helicopter.
16. Keep your goddam feet off the seats.
17. Don't snuff your cigarette-butts on the floor, use ash cans provided. After all your pilots are butt shooters.
18. Don't be inconsiderate as to ask for magazines, papers and playing cards before the crew has had a chance at them first.
19. If the engine stops or a blade falls off, don't show any fear, it may frighten the crew.
20. In bad choppy weather always share your grog with the crew, it may be the "hair of the dog" that he needs to put him to sleep.
21. Keep your goddam feet off the seats.

Instructions were published.

" ACHTENSHUN! DAS MACHINEN IST NODT FOR GERFINGERPOKEN UND MITTENGRABBEN. IST EZY FOR BREKKEN DAS SCHPRINGENWERKS, BLOWENFUSEN MIT LOUDISH POPEN UND SPITZENSPARKEN. IST NIX GER-WERKEN BY DUMKOFFS! DAS RUBBER-NECKEN SIGHDTSEEREN UND STU-PIDISCH GOOFOFFERS BAST RE-LAXEN, KIPP HENDS IN POKKETS, UND VATCH DAS SCHENRY! "

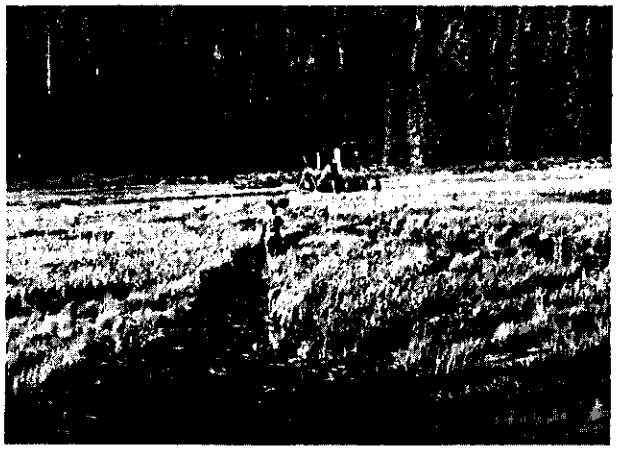
And aircraft were placarded — courtesy of arriving H-34 drivers out of Germany.

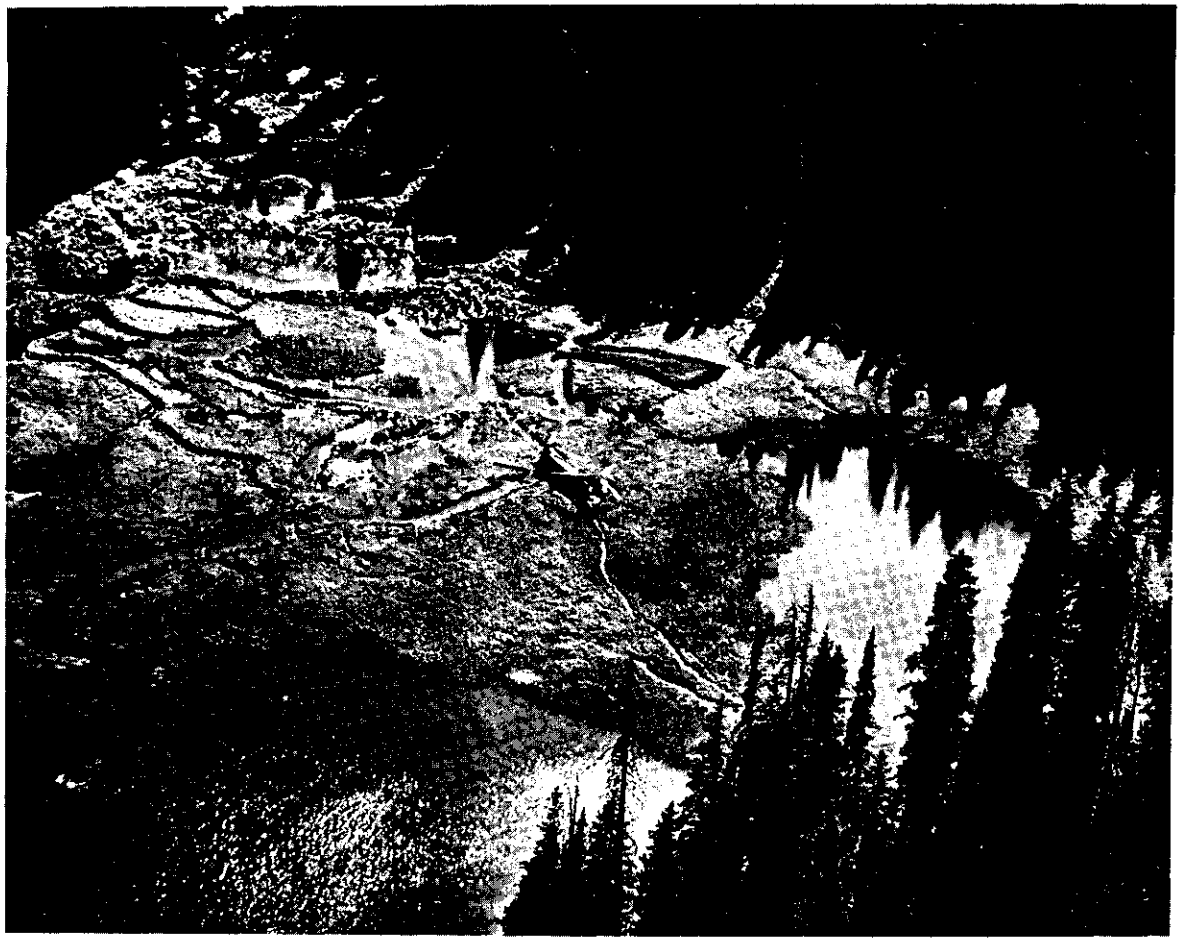
TRAINING

Mountain training on the lower slopes of Mt. Rainier, at a place called Ranger Creek, tested pilot skills.

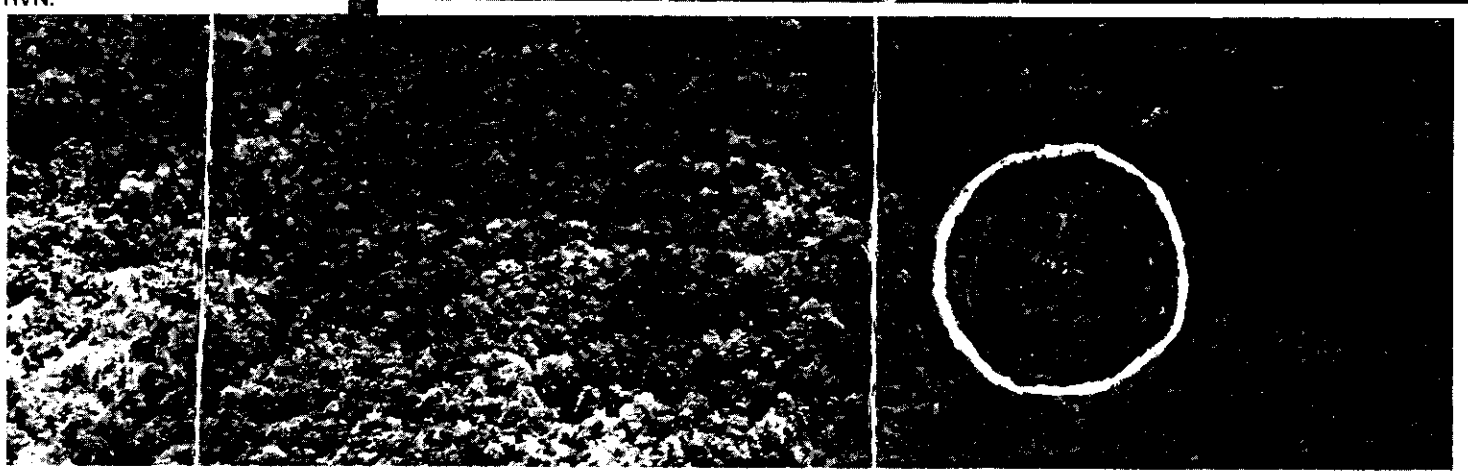
CWO's Len Wilson and Bob Eastland, got some exciting forced landing practice there when the engine quit.

Hidden Lake was all there was ...

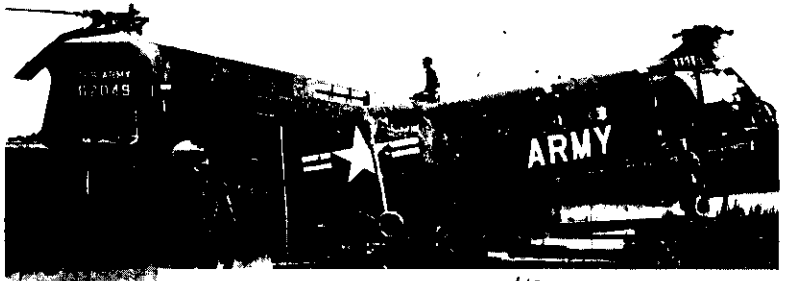


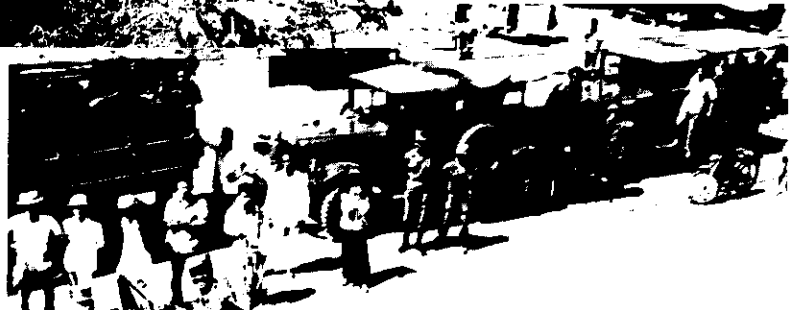


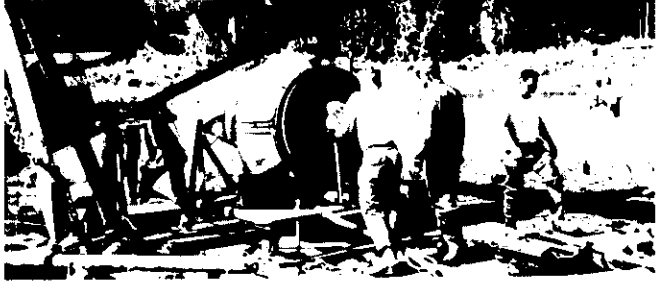
That forced landing "practice" in the forests of the Cascades was a good lesson indeed for the jungles of Vietnam. Here is a "find the helicopter" picture where another engine failure dropped a crew into a low patch — they exited from the top of this one to another hovering overhead, but this CH-21C never flew again. The Viet Cong got there first so we called a B-25 on it and blew it up on the spot — an early and controversial decision in 1962 RVN.



It was good practice for the maintenance crew, too — that was a precedent setting job, to replace the engine and complete the recovery by flying it out: a scene that was often repeated in the rice paddies and jungles of Vietnam. Although all of them were not forced landings, a total of something like 8 engine failures were experienced in the first 6 weeks of operation in RVN. There were also other causes for field recovery of course. Here Old 049 is being moved to higher and drier ground. That's CWO Clarence Nobles driving and Bill Rudd waving as she rolls through Dong Tam in the Delta.







Funny hats and false noses mark a hail and farewell at Ft. Lewis around late '58. This one to mark Dick's departure to Japan. You guessed it — next to the oriental is Mo Bone. Frank Brown and Ed Doblado complete this picture. You figure out the other one.

HEADQUARTERS FORT LEWIS
Fort Lewis, Washington

AMKLE-GCT-P&O 8 November 1961

SUBJECT: Movement Order Number 3
Movement of 57th Transportation Company (Lt Hel)(H21) and 98th TC Detachment (CHFM) from Fort Lewis, Washington to Overseas Exercise Area

THRU: Commanding General
4th Infantry Division
Fort Lewis, Washington

TO: Commanders Indicated in Distribution

1. Prepare for foreign service and move personnel and equipment of the following units from Fort Lewis, Washington to Overseas Exercise Area through Oakland Army Terminal, TCS:

UNIT	TOE	SHIPMENT NR.	AUTH STRENGTH
57th Trans Co (Lt Hel)(H-21)	55-57D	2080-A	147
98th Trans Det (CHFM)	55-500R	2080-B	56

2. Movement Instructions. a. This is a temporary Change of Station (TCS) for period in excess of 30 days. Detachment remains as presently assigned until embarkation, at which time it will be attached to Overseas Commander for period of TDY.

b. Provisions of Chapter 3, less paragraph 6b, AR 220-10 (PCM) apply.

c. Provisions of AR 612-35, as changed, do NOT apply in the selection of personnel for participation except that immunization requirements will be met and the following personnel will NOT participate:

(1) Personnel with an ETS prior to 30 May 1962.

FOR OFFICIAL USE ONLY

The orders started out classified secret ... to move to an overseas destination for a period in excess of 30 days. Final destination was contained in sealed orders not to be opened by Major Dillard until we passed Subic Bay ... but we had watched Gen. Maxwell Taylor's recent travels. We read his "Uncertain Trumpet," Lederer & Burdick's "The Ugly American," Bernard Fall's "Street Without Joy" and we searched out old copies of National Geographic on Southeast Asia. The San Francisco Chronicle announced our departure from Oakland Army Terminal on 20 Nov 1961 ... and our destination! The sailing instructions for the USNS Core were not classified.