OPERATIONAL SUPPLEMENT

FLIGHT MANUAL

USAF SERIES

UH-1N

HELICOPTER

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

9 MARCH 1982

SHORT TITLE: PROCEDURES

1. PURPOSE.

To provide aircrews with current information.

2. INSTRUCTIONS.

Page 3-10, PRACTICE AUTOROTATIONS paragraph is amended to change the third paragraph to read as follows:

The autorotation should be entered by lowering the collective to minimum while reducing the throttles to maintain zero torque. Maintain NR within limits by use of collective, and adjust airspeed between 65 to 100 KIAS depending upon gross weight and desired performance. At approximately 100 to 75 feet altitude, execute a flare to reduce ground speed, slow rate of descent, and build rotor rpm. Before completion of the flare, move throttles to full open. A slight amount of collective pitch may be used to slow forward speed and rate of descent. The helicopter attitude should be adjusted to a near level landing attitude and collective pitch increased to recover no lower than four feet above the ground with a 0-15 knots ground speed. To practice touchdown autorotations, the

throttles must be rotated and held to the flight-idle position. Failure to do so can result in power being unintentionally applied upon increasing the collective for the touchdown, resulting in a rapid right turn and possible damage to the helicopter. The touchdown autorotation procedure is the same as for the power recovery except the throttles are placed in flight-idle after it is confirmed that the aircraft will touchdown in a suitable area.

THE END

FLIGHT MANUAL, SAFETY SUPPLEMENT, AND OPERATIONAL SUPPLEMENT STATUS

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FLIGHT MANUAL	DATE	CHANGE NO.
1H-1(U)N-1	1 Sep 73	12 - 30 Jul 81

FLIGHT CREW CHECKLIST	DATE	CHANGE NO.
1H-1(U)N-1CL-1	1 Sep 73	11 - 30 Jul 81
1H-1(U)N-1CL-2	1 Sep 73	11 - 30 Jul 81

CURRENT SUPPLEMENTS

NUMBER	DATE	SHORT TITLE	FLIGHT MANUAL PAGES AFFECTED
S-93	20 Mar 81	Modified AN/ARC-164(V) Radios	4-16A, 4-17
S-94	2 Sep 81	Procedures	Sec II, IV, V, VIII
SS-95	16 Nov 81	Procedures	Sec IV
S-96	7 Dec 81	Boost Pumps	3-12, 3-14
S-100	12 Jan 82	Hydraulic Fluid	Sec I
S-101	2 Feb 82	Procedures	Sec II
S-102	9 Mar 82	Procedures	Sec III

REPLACED/RESCINDED SUPPLEMENTS

NUMBER	DATE	DISPOSITION

OPERATIONAL SUPPLEMENT

FLIGHT MANUAL

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THIS PUBLICATION SUPPLEMENTS TO 1H-1(U)N-1 DATED 1 SEPTEMBER 1973 AND REPLACES INTERIM OPERATIONAL SUPPLEMENT TO 1H-1(U)N-1S-99 DATED 5 JANUARY 1982.

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

SHORT TITLE: PROCEDURES

2 FEBRUARY 1982

1. PURPOSE.

To provide aircrews with current information on Rotor Brake engagement.

2. GENERAL.

The Navy has experienced fatigue related failure problems with the spiral bevel gear on the coast down side in the main transmission. Also, there is evidence of Rotor Brake pinion strike marks on the coast down side of the main bevel gear. Pending development of special and conditional inspections, Rotor Brake usage should be limited and recorded. Aircrew personnel should be aware of the seriousness of torsional overloads on Rotor Brake equipped helicopters. Personnel should also be instructed that in the event unusual noises are heard coming from the area of the transmission, flight operations should be terminated as soon as possible and the cause investigated and corrected before flight.

3. INSTRUCTIONS.

a. Page 2-12, ENGINE SHUT-DOWN paragraph is amended to change item 5 to read as follows:

5. Rotor Brake — Apply Only At 0% Nr.

CAUTION

Pilots should use caution and be alert during high or gusty wind operations. Rotor Brake usage with rotors turning is restricted to emergency usage. If the pilot is unable to control the rotor tip path plane at low rotor speeds with the cyclic due to extremely high and/or gusty winds, the Rotor Brake may be applied to prevent damage to the aircraft. Rotor Brake usage above 0% Nr must be recorded in the aircraft forms. Also, pilots should physically monitor cyclic pitch control until rotor has stopped. Do not pump collective control to slow the rotor.

b. Changes to the PILOTS' FLIGHT CREW CHECKLIST (TO 1H-1(U)N-1CL-1) are reproduced so that appropriate pages may be cut out and inserted in the binder, in lieu of existing pages, pending change to the manual and checklist. Reference to this supplement will be made on the title page of the checklist.

THE END

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SS-95	16 Nov 81	Procedures	Sec IV
S-96	7 Dec 81	Boost Pumps	3-12, 3-14
S-100	12 Jan 82	Hydraulic Fluid	Sec I
S-101	2 Feb 82	Procedures	Sec II

REPLACED/RESCINDED SUPPLEMENTS

NUMBER	DATE	DISPOSITION
S-99 (Int.)	5 Jan 82	Replaced by S-101

OPERATIONAL SUPPLEMENT

FLIGHT MANUAL

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

12 JANUARY 1982

SHORT TITLE: HYDRAULIC FLUID

1. PURPOSE.

To provide aircrew members with current information.

2. INSTRUCTIONS.

Page 1-41, figure 1-22 is amended to add a new hydraulic fluid to the Fluid Specifications to read as follows:

Hydraulic Fluid	*MIL-H-83282

*MIL-H-5606 and MIL-H-83282 are interchangeable but mixing the fluids reduces the fire resistance of MIL-H-83282.

NOTE

MIL-H-83282 should not be used below -32°C (-25° F).

THE END

AFLC RAFB, GA

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S-96	7 Dec 81	Boost Pumps	3-12, 3-14
S-99 (Int.)	5 Jan 82	Procedures	Sec II
S-100	12 Jan 82	Hydraulic Fluid	Sec I

REPLACED/RESCINDED SUPPLEMENTS

NUMBER	DATE	DISPOSITION
S-97 (Int.)	17 Dec 81	Replaced by S-98 (Int.)
S-98 (Int.)	4 Jan 82	Replaced by S-99 (Int.)

OPERATIONAL SUPPLEMENT

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

7 DECEMBER 1981

SHORT TITLE: BOOST PUMPS

1. PURPOSE.

To advise flight crews of possible engine failure above 4,600 feet density altitude in the event of boost pump failure.

2. INSTRUCTIONS.

Pages 3-12 and 3-14, FUEL BOOST PUMP FAILURE paragraph is amended to read as follows:

FUEL BOOST PUMP FAILURE

The helicopter is equipped with two electrically driven fuel boost pumps, either of which is capable of supplying sufficient fuel to both engines. A helicopter fuel system failure will not be common because of separate RIGHT and LEFT fuel boost pumps. Failure of a boost pump will be indicated by the master caution light and the appropriate caution segment

panel light. In order to retain redundancy in the system, the following procedures should be used. In the event of a boost pump failure, set fuel crossfeed switch to ON position, which will allow the operative pump to supply both engines. Pull the failed boost pump circuit breaker (No.1 or No. 2 FUEL BOOST) to remove electrical power from failed pump.

WARNING

Flight above 4,600 feet density altitude can result in engine flameout with both boost pumps inoperative.

THE END

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REPLACED/RESCINDED SUPPLEMENTS

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Published under authority of the Secretary of the Air Force.

16 NOVEMBER 1981

SHORT TITLE: PROCEDURES

1. PURPOSE.

To provide aircrew members with current information.

2. INSTRUCTIONS.

Page 4-46, MISCELLANEOUS EQUIPMENT, GROUND HANDLING WHEELS paragraph is amended to read: Ground handling wheels are available for each of the landing gear skids. The wheels are for the purpose of ground handling, i.e., pushing or towing the helicopter. The wheels will be removed prior to engine start.

THE END

FLIGHT MANUAL, SAFETY SUPPLEMENT, AND OPERATIONAL SUPPLEMENT STATUS

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S-94	2 Sep 81	Procedures	Sec II, IV, V, VIII
SS-95	16 Nov 81	Procedures	Sec IV

REPLACED/RESCINDED SUPPLEMENTS

NUMBER	DATE	DISPOSITION

OPERATIONAL SUPPLEMENT

FLIGHT MANUAL

USAF SERIES

UH-1N

HELICOPTER

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SEP 29 1981

THIS PUBLICATION SUPPLEMENTS TO 1H-1(U)N-1 AND REPLACES OPERATIONAL SUPPLEMENT TO 1H-1(U)N-1S-91 DATED 29 AUGUST 1980.

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

2 SEPTEMBER 1981

SHORT TITLE: PROCEDURES

1. PURPOSE.

To provide aircrew members with current information.

2. INSTRUCTIONS.

a. Page 2-3, INTERIOR AND BEFORE START paragraph is amended to change item *23 to read: *23. Rotor Brake - OFF.

b. Pages 2-4 through 2-6 are amended to change STARTING ENGINES procedures to read as shown in this supplement.

AFLC RAPB, GA

STARTING ENGINES.

WARNING

To preclude possible hearing loss, aircrews should insure that all personnel within 30 feet of the aircraft wear hearing protection.

1. Throttles - CHECKED AND CLOSED.

WARNING

To prevent throttle interaction during all phases of flight, some throttle friction should be applied to each throttle. The friction should not be tightened to the point where they are difficult to move. This condition can be as hazardous as insufficient friction.

NOTE

Throttle pressure against the flight idle stop during an attempted shutdown will prevent plunger release and throttle closure.

   a. Open throttle to ground idle.

   b. Actuate flight idle stop switch.

   c. Check full open.

   d. Flight idle.

   e. Flight idle release.

   f. Set at full closed.

2. Beep Switch - DECREASE (hold 3 seconds).

3. Main Fuel Switches - ON.

4. Rotors - CLEAR.

5. Fire Guard - POSTED.

NOTE

During engine start and run-up, have the ground crew/flight mechanic inspect the transmission, engine, and combining gearbox compartments for leakage of fuel, oil or hydraulic fluids. Check hydraulic filter indicator for a "black" indication.

6. Engine - START.

   a. Starter - ENGAGE.

   b. Engine Oil Pressure - Indicating.

   c. Throttle - At 12% Ng minimum, open to ground idle.

CAUTION

If ITT fails to rise within 15 seconds after opening the throttle, close the throttle and turn Main Fuel Switch and Starter OFF. Allow a 30-second fuel draining period, followed by a 15-second motoring run before attempting another start. If, for any reason, a starting attempt is discontinued, allow the engine to come to a complete stop and then accomplish a motoring run. Repeat the complete starting sequence, observing the starter limits.

   d. ITT - Monitor.

CAUTION

If ITT exceeds 1090°C, move the throttle to OFF position and discontinue start. ITT above 870°C shall be monitored during start and if time exceeds limits shown in figure 5-2, a hot start has occurred.

   e. Starter - OFF at 50% Ng.

CAUTION

It is possible to move the starter switch through the OFF position and inadvertently engage the other starter.

7. Inverter - MAIN (if battery start was made).

8. Combining Gearbox Oil Pressure - INDICATING.

9. Transmission Oil Pressure - INDICATING.

10. Engine Oil Pressure - WITHIN LIMITS.

11. Throttle Sequence - COMPLETED.

    a. Engine Ng - Stabilized.

    b. Flight Idle Stop Switch - Actuate.

    c. Throttle - Open to approximately 85% Ng.

NOTE

Allow approximately five seconds for flight idle plunger actuation.

    d. Throttle - Flight idle (61 $\pm$ 2%).

    e. Throttle - 71% Ng.

    f. Throttle Friction - Set.

12. Generator - ON (if battery start was made, turn operating engine generator ON and accomplish the following):

    a. Battery Switch - ON.

    b. Anti-collision/Strobe Lights - AS REQUIRED.

    c. Navigation Lights - AS REQUIRED.

    d. Fuel Quantity - CHECKED.

WARNING

The fuel quantity, fuel flow and low fuel warning indicators are not precise and should not be relied upon for an indication of a safe fuel reserve. The fuel quantity indicator may be in error by as much as 30 pounds.

    e. Primary Communications Radio - ON.

    f. Check generator voltage 27-28.5.

13. Fire Guard - POSTED.

14. Second Engine - START.

    a. Starter - ENGAGE.

    b. Engine Oil Pressure - Indicating.

    c. Throttle - At 12% Ng minimum, open to ground idle.

    d. ITT - Monitor.

    e. Start - OFF at 50% Ng.

CAUTION

Ensure that the second engine has engaged. A non-engaged engine is indicated by near zero torque, high Nf, and much cooler ITT compared to the engaged engine. If a non-engagement occurs, slowly close the throttle of the non-engaged engine to OFF. When the non-engaged engine has stopped, shut down the engaged engine. If an abrupt Nf deceleration, jolt, or noise occurs during shutdown, enter the discrepancy in AF Form 781 and do not attempt another start. If shutdown is normal, a restart may be attempted by starting the engine that failed to engage, first, and a normal engagement should result.

15. Engine Oil Pressure - WITHIN LIMITS.

16. Throttle Sequence - COMPLETED.

16A. Battery - CHECKED ON.

17. External power - DISCONNECTED.

18. Generators - ON.

19. DC Electrical systems - CHECKED (First flight of the day).

    a. No. 1 generator - Off. Check No. 2 generator voltage 27-28.5 and No. 2 ammeter increased load. Check No. 1 generator voltage and ammeter indications zero, and caution light illuminated. Check Non-Essential bus voltage 27-28.5.

b. Non-Essential Bus Switch - Normal. Check voltage indicates zero, then return the switch to MANUAL position.

c. No. 1 generator - On. Observe engine No. 1 DC generator caution light extinguishes and ammeters indicate load sharing.

d. No. 2 generator - Off. Check No. 2 generator voltage and ammeter indications zero, and caution light illuminated. Check generator No. 1 voltage 27-28.5 and No. 1 ammeter increased load. Check Non-Essential bus voltage 27-28.5.

e. Non-Essential Bus Switch - Normal. Check voltage indicates zero.

f. No. 2 generator - On. Observe engine No. 2 DC generator caution light extinguishes, ammeters indicate load sharing, and Non-Essential bus voltage 27-28.5.

g. Voltmeter Selector Switch - ESS Bus.

20. Non-Essential Bus Switch - As Required. During night and hoist operations, the non-essential bus switch should be in the manual position to preclude loss of electrical power to the search light and hoist controls due to generator(s) failure.

c. Page 2-7, BEFORE TAKE OFF paragraph is amended to change the words "Pitot Leat" to read: Pitot Heat.

d. Page 4-46 is amended to add the following WARNING to RESCUE HOIST-OPERATION paragraph as the third WARNING after the paragraph as the third WARNING after the paragraph heading:

- Internal rescue hoist is restricted from operation and shall remain in the stowed position any time the M-23 gun system is in operation or in the FIRE MODE.

e. Page 5-2 is amended to replace figure 5-1 (sheet 1 of 2) with figure 1 of this supplement.

f. Page 8-2C/8-2D is amended to change INFLIGHT (AFTER PICKUP - MISSION COMPLETE) paragraph to read as follows:

INFLIGHT (AFTER PICKUP - MISSION COMPLETE)

1. "SURVIVOR IN AND SECURE, READY FOR TAKEOFF" (HO).
2. Hot Mike - OFF (HO).
3. Hoist - SECURED (HO).
4. Hoist Power Switch - "OFF" (P).
5. Non-Essential Bus Switch - "AS REQUIRED" (P).
6. "After Pickup Checklist COMPLETED" (HO).

g. Page 8-2C/8-2D is further amended to add the following after INFLIGHT paragraph:

POSTFLIGHT

Enter "Hoist Used" in AFTO Form 781A after any flight where the hoist was utilized, to insure a thorough maintenance BPO of the hoist system is accomplished.

GUNNER

The gunner will be responsible for maintenance, servicing, inspection, and security of the Armament Subsystems. He will perform duties as directed by the Pilot and be familiar with the duties of the flight mechanic. Refer to T.O. 1H-1(U)N-34-1-1.

MEDICAL TECHNICIAN

The medical technician will be a fully qualified medic, capable of accompanying patients on medical evacuation flights.

INSTRUMENT MARKINGS

TRANSMISSION OIL TEMPERATURE AND PRESSURE

TEMPERATURE (T)

110°C

PRESSURE (P)

30 psi
30 to 40 psi
40 to 70 psi
70 psi

GAS PRODUCER TACHOMETER

100%

Normal operating limit at Power	100%
No load (Flight idle).	61% ± 2%
Acceleration (Transient 10 second limit)	101%

COMBINING GEARBOX OIL TEMPERATURE AND PRESSURE

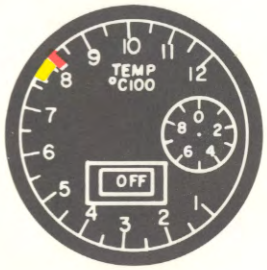
TEMPERATURE (T)

116°C

PRESSURE (P)

40 psi
40 to 60 psi
60 to 85 psi
85 psi

INTER TURBINE TEMPERATURE



767 to 810°C
810°C

FUEL FLOW

BASED ON JP-4 FUEL

ENGINE OIL TEMPERATURE AND PRESSURE

TEMPERATURE (T)

116°C

PRESSURE (P)

40 psi
40 to 80 psi
80 to 112 psi
112 psi

NOTE: 150 PSI MAX AT OAT − 45°F. (-43°C)

212072-2-1G

Figure 1. Instrument Markings

h. Pages 8-3 and 8-4 are amended to delete all text therein.

i. Changes to the CREW MEMBERS' FLIGHT CREW Checklist (TO 1H-1(U)N-1CL-2) are reproduced so that appropriate pages may be cut out and inserted in the binder, in lieu of existing pages, pending change to the manual and checklist. Reference to this supplement will be made on the title page of the checklist.

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CURRENT SUPPLEMENTS

NUMBER	DATE	SHORT TITLE	FLIGHT MANUAL PAGES AFFECTED
S-93	20 Mar 81	Modified AN/ARC-164(V) Radios	4-16A, 4-17
S-94	2 Sep 81	Procedures	Sec II, IV, V, VIII

REPLACED/RESCINDED SUPPLEMENTS

NUMBER	DATE	DISPOSITION
S-91	29 Aug 80	Replaced by S-94
S-92	5 Feb 81	Incorporated in Change 12

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

20 MARCH 1981

SHORT TITLE: MODIFIED AN/ARC-164 RADIOS

1. PURPOSE.

To provide aircrews with procedures for an improved near-term, air-air, and air-ground-air, jam-resistant Ultra-High Frequency (UHF) voice communication capability.

2. INSTRUCTIONS.

a. Page 4-16A is amended to add a view of modified AN/ARC-164(V) Radio as depicted in figure 1 of this supplement.

b. Page 4-17 is amended to add the following new paragraph to appear immediately preceding BEARING DISTANCE HEADING INDICATOR paragraph:

UHF COMMAND RADIO AN/ARC-164(V) (MODIFIED BY TO 1H-1(U)N-629)

System Description

The modified system consists of a modification to selected airborne and ground-based radios, providing them with a frequency hopping capability. Frequency hopping is a

technique where the channel or frequency being used for communication on a given link is rapidly changed many times per second.

In the active mode, the radio has the ability to receive and process two simultaneous transmissions on the same net. This conferencing capability is available by selecting 00, 50, or 75 with the hundredths/thousandths manual frequency selector switch, then operating in the active mode. Conferencing is disabled when the net number ends in 25.

In a conference net, the second transmitting radio will automatically shift its transmission frequency by 25 kilohertz (KHZ) when it monitors a transmission on the primary net frequency. The wide band receiver will read both transmissions without the interference normally associated with two radios transmitting on the same frequency simultaneously. Three simultaneous transmissions will result in garbled reception.

NOTE

When operating in the secure voice mode, conferencing is automatically disabled.

NOTE

In the active mode, ADF will function, but accuracy will be degraded depending on the frequency hop rate.

System Operation

The usual operating mode for a modified radio will be its normal mode where it uses any one of the 7000 channels available to the UHF communication band. Use and operation of the radio will be just as they are currently done. The two-position switch on the Control Head is replaced with a four-position switch to provide two new functions. The modified AN/ARC-164 retains the same form/fit as the unmodified radio.

a. All the controls of the modified AN/ARC-164 retain the same functions except as follows (see figure 1 of this supplement):

(1) 200/300 MHz Selector Knob (A-3-2-T Switch).

- "A" position selects active (jam-resistant) Mode.

- Selects 100s digit frequency (either 2 or 3) in Normal Mode.

- "T" position selects input of a new Time Of Day (TOD) up to one minute after being selected. The "T" position is a momentary, spring-return position. "T" position, in conjunction with simultaneously pressing TONE switch, is used for emergency start-up of TOD clock when TOD is not available from external sources. This emergency TOD will not be synchronized to Universal Coordinated Time (UCT).

NOTE

The radio will automatically accept the first (TOD) signal it receives after power-up. If the operator requires a new TOD after this initial synchronization, he must momentarily depress this switch to the "T" position. The system will then accept the first TOD received within one minute.

b. Preset Channel Selector Switch. Selects one of 14 to 19 preset channels in Normal Mode. In active mode, as many as six preset channels (15-20) may be used for loading Word of Day (WOD). In the normal mode, the radio will not use the memory contents used for WOD storage as operating frequencies. Any of the preset channels 19-15 not used for the WOD may be used in the normal mode as preset channels.

c. Tone Switch.

- Prior to TOD reception, there is no change; it operates as a 1020 Hz tone transmission switch.

- After TOD has been received, it will transmit (TOD) followed by the 1020 Hz tone on the selected frequency.

- In conjunction with the A-3-2-T switch, starts the TOD clock within the radio. This is done by simultaneously selecting the "T" position and depressing the TONE button.

d. Preset Switch.

Stores selected frequency in selected preset channels in Normal Mode and WOD in active Mode. WOD storage starts in preset 20 and may extend through preset 15. Those presets (19-15) not used for WOD may be used in the normal mode as preset channels.

Operational Procedures

Existing capabilities of modified radios are preserved to the maximum extent possible when the radios are operated in their normal mode, and no new procedures are required for normal radio operation.

To operate in the active mode, the radios must first be initialized ("primed"). This requires setting into the radio three control entries; i.e., Time of Day, Word of Day, and net number.

a. Time of Day (TOD).

(1) Correct TOD may be transmitted to a modified AN/ARC-164 by feeding the receiver with a radio signal carrying the proper time modulation. The signal may be provided by another modified radio which has the correct time, or it may be provided by the ground-based clock SG-1192/TRC.

(2) TOD entry must be done after the radio is switched on. The clock inside the radio would lose time when the radio is switched off. TOD entry would normally be done on the ground prior to take-off, although it can be easily done while in flight. This also permits time corrections in flight, when necessary.

(3) It is possible to transmit and receive timing information in both normal and active modes, by momentarily depressing the TONE button. In normal mode, a complete TOD message is transmitted; while in the active mode, only an updating time-tick is used. The purpose of the active mode time transmission is to allow a time update to take place in the event that a radio is drifting out of synchronization. An operator will know that his radio requires an update when incoming messages from several different radios do not sound as they should. If incoming messages from only one radio sound poor, then it is that radio which requires an update.

Time of Day (TOD) and TOD Update Reception

a. Normal Mode. The radio will automatically accept only the first TOD message received after power-up, whenever it occurs. Subsequent messages will be ignored unless the operator first selects the "T" position on the A-3-2-T switch. To receive time in normal mode, rotate the A-3-2-T switch to the "T" position and return to a normal channel (either manual or preset) on which TOD is being transmitted.

b. Active Mode. To receive a time update in active mode, rotate the A-3-2-T switch to the "T" position and then back to the "A" position.

NOTE

Depressing the TONE button will send out a TOD update if in the active mode or a complete TOD message if in the normal mode.

NOTE

When the "T" position is selected, the radio will accept the next TOD received in either normal or active mode, provided that it arrives within one minute of the time the "T" position has been selected.

Word of Day (WOD)

a. The WOD defines for the radio the choice of frequency hopping pattern for the day. (The choice is a managerial function and the same WOD may be used for one or many days.)

b. WOD entry is normally done on the ground prior to take-off, although it is possible to enter it while in flight. If the radio is switched off after the entry of WOD, the data will not be lost since it is entered into a non-volatile memory.

c. The entry of WOD is accomplished by using preset channels 20 through 15. To enter a WOD, the radio is set to the preset mode starting at channel 20. At this point, a single or double BEEP will be heard, indicating that the radio is ready to accept WOD entry. The first segment of the WOD is set with the manual frequency selector switch and the preset button is depressed to enter the WOD in non-volatile memory. The next channel is selected, the next WOD segment is set on the manual frequency selector switches, and the WOD segment is entered in non-volatile memory as before. The process is repeated, using successive channels until

WOD entry is complete. Once the entire WOD is entered, it must be transferred to volatile memory. This is accomplished by returning to channel 20. A single or double BEEP will be heard. A single BEEP indicates the next lower channel needs to be selected. The operator continues selecting the next lower channel until the double BEEP is heard. This indicates the transfer has been completed.

d. When the radio is switched off, the WOD data is not lost but stored in a non-volatile memory in the switching unit. When the radio is switched on, the WOD must be transferred from the non-volatile memory in the switching unit to the receiver-transmitter. This is done by selecting the preset mode and starting with preset channel 20, rotating the preset channel switch backwards. The operator will hear a single or double BEEP. A single BEEP indicates that entry of WOD is not complete but has been transferred and accepted. After the single BEEP is heard, the operator selects preset 19, 18, etc., and continues transferring WOD until a double BEEP is heard. This double BEEP indicates WOD transfer is complete.

e. Net Number. Once TOD and WOD have been entered, any valid active net number may be selected by using frequency selector knobs.

Operation of AN/ARC-164 in Active Mode

a. Rotate function control switch to the MAIN or BOTH position.

b. Select preset position with the mode control switch.

c. Enter word of day in presets 20 through 15 (starting with preset 20 and working back).

d. Select MANUAL or PRESET position with the mode control switch.

e. Enter TOD by selecting frequency on which TOD is being transmitted or by requesting a TOD transmission.

f. Select active net number on frequency selector knobs or any preset designated for active use.

g. Select A on the A-3-2-T switch.

NOTE

The radio may now be operated in the normal mode by deselecting the "A" position and selecting the desired frequency. A preset channel may also be selected. To return to the active mode, the operator must select the desired active net and then select "A" on the A-3-2-T switch. An audible tone will be heard in the headset when the active mode is improperly selected. The tone will be heard when the active mode is selected and:

- An invalid active net is selected, or;
- TOD has not been initially received, or;
- WOD of day has not been entered.

If the function switch is on BOTH and the active mode is selected, any transmission on the GUARD channel will take precedence over the active mode. If GUARD channel is being jammed, operator should then select MAIN on the function switch.

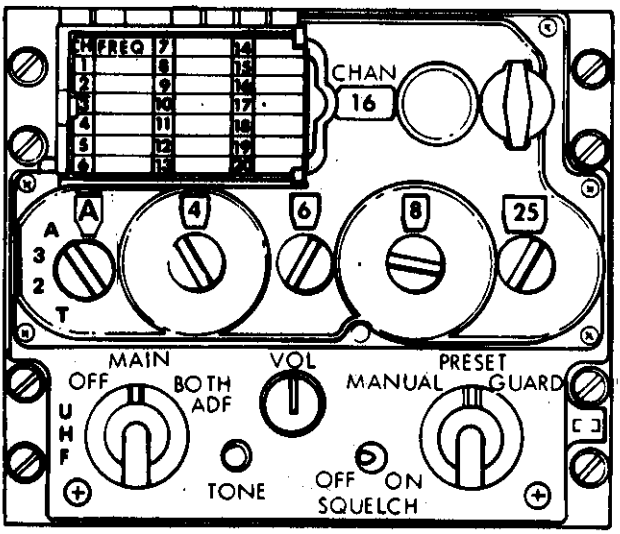

Figure 1. AN/ARC-164(V) Modified Control Panel

THE END

FLIGHT MANUAL, SAFETY SUPPLEMENT, AND OPERATIONAL SUPPLEMENT STATUS

This page is published with each Safety and Operational Supplement. It provides a comprehensive listing of the current Flight Manuals, Flight Crew Checklist, Safety Supplements, and Operational Supplements. If you are missing any publications listed on this page, see your Publications Distribution Officer and get your copy.

FLIGHT MANUAL	DATE	CHANGE NO.
1H-1(U)N-1	1 Sep 73	11 - 31 Jul 80

FLIGHT CREW CHECKLIST	DATE	CHANGE NO.
1H-1(U)N-1CL-1	1 Sep 73	10 - 31 Jul 80
1H-1(U)N-1CL-2	1 Sep 73	9 - 31 Jul 80

CURRENT SUPPLEMENTS

NUMBER	DATE	SHORT TITLE	FLIGHT MANUAL PAGES AFFECTED
S-91	29 Aug 80	Procedures	4-46, 8-3
S-92	5 Feb 81	Procedures	3-8
S-93	20 Mar 81	Modified AN/ARC-164(V) Radios	4-16A, 4-17

REPLACED/RESCINDED SUPPLEMENTS

NUMBER	DATE	DISPOSITION

T.O. 1H-1(U)N-1

FLIGHT MANUAL

USAF SERIES

UH-1N

HELICOPTER

DAAJ01-69-C-0085(2B)
F09603-81-C-0108

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~~1OS-99~~
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This Change Incorporates Operational Supplement T.O. 1H-1(U)N-1S-91 Dated 5 May 1980.

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Commanders are responsible for bringing this publication to the attention of all affected personnel.

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF AIR FORCE

1 SEPTEMBER 1973
CHANGE 12 30 JULY 1981

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 296 CONSISTING OF THE FOLLOWING:

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CURRENT FLIGHT CREW CHECKLISTS

1H-1(U)N-1CL-1	1H-1(U)N-1CL-2
1 SEPTEMBER 1973	1 SEPTEMBER 1973
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Zero in this column indicates an original page.

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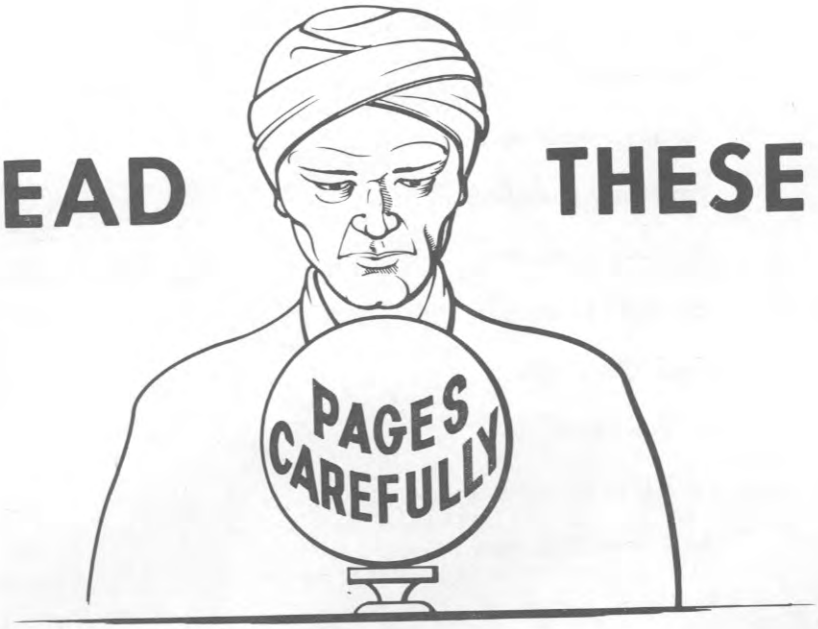

SCOPE

This manual contains information which will provide you with a general knowledge of the aircraft, its characteristics, and specific normal and emergency operating procedures. Your flying experience is recognized; therefore, basic flight principles are avoided. Multiple emergencies, adverse weather, terrain, or extenuating circumstances may require modification of any procedure(s) presented in this manual.

PERMISSIBLE OPERATIONS

The flight manual takes a positive approach and normally states only what you can do. Unusual operations or configurations (such as asymmetrical loading) are prohibited unless specifically covered herein. Clearance must be obtained from the Flight Manual Manager before any questionable operation is attempted which is not specifically permitted on this manual.

HOW TO BE ASSURED OF HAVING LATEST DATA

You must constantly be aware of the latest manual, checklist, and status of supplements. The latest formal supplement (safety or operational) will have a supplement status page which provides the current status of your flight manual. If you should have any doubts concerning the status of your flight manual, check with your flight manual distribution officer.

SAFETY AND OPERATIONAL SUPPLEMENTS

Safety supplements are issued as an expeditious means of reflecting safety information when hazardous or safety conditions exist. These supplements contain operational, precautionary, and restrictive instructions that affect safety and safety modifications.

Operational supplements are issued as an expeditious means of reflecting information when mission essential operational procedures are involved. Supplements are issued by teletype (interim) or by printed copy (formal) depending upon the urgency. Interim supplements are formalized and replaced with a new number within 30 days. Formal printed supplements are identified by red letters "SS" for safety supplements and black letters "OS" for operational supplements printed around the borders of the title pages. File your supplements in accordance with T.O. 00-5-1.

STANDARDIZATION AND ARRANGEMENT

Standardization assures that the scope and arrangement of all Flight Manuals are identical. The manual is divided into ten fairly independent sections to simplify reading it straight through or using it as a reference manual.

CHECKLISTS

The Flight Manual contains amplified normal and emergency procedures. Checklists contain these procedures in abbreviated form and are issued as separate technical orders. See the list of effective pages or the latest supplement status page for latest applicable checklists. Line items in the Flight Manual and Checklists are identical with respect to arrangement and item number. If authorized by an interim safety or operational supplement that affects a checklist, write in the applicable change on the affected checklist. Within 30 days, a formal supplement will be issued with the revised checklist page attached.

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Loose leaf binders and sectionalized tabs are available for use with your manual. These are obtained through local purchase procedures and are listed in the Federal Supply Schedule (FSC Group 75, Office Supplies, Part I). Binders are also available for carrying your condensed checklists. These binders contain plastic envelopes into which individual checklist pages are inserted. They are available in three capacities and are obtained through normal Air Force Supply under the following stock list numbers: 7510-766-4268, -4269, and -4270 for 15, 25, and 40 envelope binders respectively. Check with your supply personnel for assistance in securing these items.

YOUR RESPONSIBILITY - TO LET US KNOW

Every effort is made to keep the Flight Manual current. Review conferences with operating personnel and a constant review of accident and flight test reports assure inclusion of the latest data in the manual. However, we cannot correct an error unless we know of its existence. In this regard, it is essential that you do your part. Comments, corrections, and questions regarding this manual or any phase of the Flight Manual program are welcomed. These should be forwarded on AF Form 847 through your Aircrew Standardization/Evaluation Channels to Warner Robins Air Logistics Center, Robins AFB, Georgia 31098, Attn: MMSRDD.

GLOSSARY OF ABBREVIATIONS, SYMBOLS, AND DEFINITIONS

The following definitions apply to "Warnings" "Cautions" "Notes" "Shall" "Will" "Should" and "May" found throughout the manual.

WARNING

Operating procedures, techniques, etc. which will result in personal injury or loss of life if not carefully followed.

CAUTION

Operating procedures, techniques, etc., which will result in damage to equipment if not carefully followed.

NOTE

An operating procedure, technique, etc., which is considered essential to emphasize.

SHALL

Indicates mandatory requirement.

WILL

Indicates mandatory requirement.

SHOULD

Indicates a non-mandatory desire or preferred method of accomplishment.

MAY

Indicates an acceptable or suggested means of accomplishment.

ABBREVIATIONS AND SYMBOLS

AFCU	automatic fuel control unit
alt	altitude
C	centigrade
CAS	calibrated airspeed
CG	center of gravity
F	fahrenheit
ft	feet
fpm	feet per minute
gal	gallon
GW	gross weight
hr	hour
IAS	indicated airspeed

IGE	in ground effect
ITT	inter turbine temperature
KIAS	knots indicated airspeed
KTAS	knots true airspeed
kts	knots
lb	pound(s)
lb/gal	pounds per gallon
lb/hr	pounds per hour
max	maximum
MHz	megahertz
min	minimum
Ng	gas generator speed (percent)
Nf	free turbine speed (percent)
NR	rotor speed (percent)
OAT	outside air temperature
OGE	out of ground effect (for the UH-1N this means hovering at a skid height of approximately 45 feet or higher)
P3	compressor discharge pressure
psi	pounds per square inch
Q	percent torque
R/C	rate of climb
R/D	rate of descent
rpm	revolutions per minute
SHP	shaft horsepower
SL	sea level
TAS	true airspeed
Vne	Velocity never exceed
$\frac{1}{\sqrt{\sigma}}$	The reciprocal of the square root of density ratio, at the appropriate density altitude. The Greek letter sigma (σ) is used to represent the density ratio.

RECORD OF APPLICABLE TIME COMPLIANCE TECHNICAL ORDERS

T.O. Number	Date	Title	Change (Revision) Supplement Date
T.O. 1H-1(U)N-508	31 July 1972	External Jettison Capability for Pilot and Copilot Doors.	1 September 1973
T.O. 1H-1(U)N-516	1 March 1973	To provide A. C. power for operation of Mark XII computer, Kit-1 A/SEC, APX 72 System.	1 September 1973
T.O. 1H-1(U)N-517	2 October 1972	Provide Improved Operation of Engine Idle Stop Release Solenoids.	1 September 1973
T.O. 1H-1(U)N-520	1 March 1973	Installation of Relief Valve and By-pass in Transmission Oil System.	1 September 1973
T.O. 1H-1(U)N-530		Installation of Provisions for Auxiliary Fuel System and Installation of Auxiliary Fuel System.	1 September 1978
T.O. 1H-1(U)N-532	15 October 1973	Provide Cooling for Center Console through the Ram Air Intake System.	1 September 1978
T.O. 1H-1(U)N-566		Emergency Markings Change No. 1	
T.O. 1H-1(U)N-568		Improved Generator Paralleling Circuits	1 September 1974
T.O. 1H-1(U)N-587	30 April 1975	Installation of Crashworthy Fuel System	1 July 1975
T.O. 1H-1(U)N-591	21 October 1974	Installation of Marker Beacon 51Z-4	1 July 1975
T.O. 2J-T400-523	1 August 1972	Deactivation of T5 Limiting Function	1 September 1978

Figure 1-1. The UH-1N helicopter