COMMANDING OFFICER
HELICOPTER ATTACK (LIGHT) SQUADRON THREE
FPO SAN FRANCISCO 96627

HA(L)-3:20:gf
3510
Ser: 039
1 August 1970

From: Commanding Officer
To: Distribution List

Subj: Change One to HA(L)-3 Tactics Manual; transmittal of

Encl: (1) New pages 3-31, 3-31a, and 3-32 of subject manual
(2) List of Effective Pages

1. Make the following pen and ink changes to subject manual:

a. Figure 1-8, change to read figure "1-7" vice "1-8"

2. Remove pages 3-31 and 3-32 of subject manual and add enclosure (1) of this transmittal. Insert enclosure (2) in the proper place.

M. J. TWITE, Jr.

Distribution:
HA(L)-3 INST 5216.2B
List I (Dots 2 copies)
CNO
CHNAVMAT
COMNAVORDSYSCOM
COMNAVAIRSYSCOM
COMNAVSAFCEN
CINCPAC
CINCPACFLT
CINCLANT
CINCLANTFLT
COMNAVFORV
COMRIVPATFOR (6 copies)
COMNAVAIRPAC
COMNAVAIRLANT
COMFAIRWESTPAC
COMPHIBPAC
COMPHIBLANT
COMTRAPAC
COMTRALANT
COMPHIBTRAPAC
COMPHIBTRALANT
COMOPTEVFOR
CO, NIOTC, MARE ISLAND
NADC, JOHNSVILLE
ELEVENTH AVIATION GROUP (U.S. ARMY)
COMNAVAIRTESTCEN

Distribution: (Continued)
CO, HT-8, NAS ELLYSON FIELD
CO, VX-5
CO, VAL-4
CO, HC-1
CO, HC-2
CO, HC-3
CO, HC-4
CO, HC-5
CO, HC-6
CO, HC-7
CO, HS-1
CO, HS-2
CO, HS-3
CO, HS-4
CO, HS-5
CO, HS-6
CO, HS-7
CO, HS-8
CO, HS-10
CO, HS-11
U. S. ARMY AVIATION TRAINING CENTER, FT. RUCKER (3 Copies)

List of Pages in Effect

After Change 1 is inserted, the TACTICS Manual consists of the following pages which are part of the original issue unless indicated otherwise.

PAGE(S)	CHANGE
1-2	0
3-Reverse Blank	0
4	1
i-ii	0
iii-iv	0
v-Reverse Blank	0
Appendix A-Reverse Blank	0
1-1 - 1-40	0
1-41-Reverse Blank	0
Fig 1-1 - Fig 1-6	0
Fig 1-7-Reverse Blank	0
2-1 - 2-18	0
3-1 - 3-30	0
3-31 - 3-31a	1
3-32 - Reverse Blank	1
3-33 - 3-48	0
3-49-Reverse Blank	0

and the weapons are aligned. If the aiming point is selected at less than infinity, the axis of each weapon will converge at the aiming point.

B. PARALLEL LINE.

This method uses a sighting board which is aligned with the helicopter. The sight and the weapons are aligned with measured points on the sighting board. In this method, the axis of the weapons do not converge.

3-17A.HARMONIZATION

Harmonization is the process of aligning the weapons so that the rounds impact at the sighting point for a given range. This is accomplished by aligning the sight, the weapons, or both, using the "burst-on-target" method.

SIGHTING TECHNIQUES

A. FIXED SYSTEMS.

The techniques required to fire aerial rockets are more restrictive than those for firing fixed/stowed guns; therefore, this discussion will be limited to rocketry. The same techniques will ensure accurate fire with fixed/stowed guns. Aerial rockets are affected by many variables (such as crosswind, relative wind, and flight coordination) which can be compensated for. Because of these variables and their adverse affect on rocket accuracy, two methods of sighting will be discussed. These sighting methods are the pipper intersection, and the combat sight.

(1) Pipper intersection method. Affixed to each infinity-type sight is a decal containing pipper intersection method reference data. The pipper intersection method provides for variable altitudes but requires altitude, airspeed, and range to be determined prior to launch. Generally these conditions are known only for preplanned fires (preparations, etc.) and require precise timing. However, even though the pipper intersection method does allow some variation in altitude, it seriously restricts maneuver and

is normally unacceptable for most mission profiles. To use the pipper intersection method, apply the following steps:

(a) Select the altitude and range from which to fire.

(b) Apply the elevation setting for selected airspeed and range to the sight elevation/depression knob.

(c) Fly the helicopter at the predetermined altitude, airspeed and range.

(d) When the pipper is on the target, fire the rockets.

(2) Combat sight method. The combat sight method is the most widely used and gives the desired accuracy and timeliniess over the

widest variety of mission profiles. It requires very little mathematical or manual manipulation, either of which is distracting during target attack; and, by using a single sight setting, it allows engagement of targets over widely varying ranges without adjustment of the sight. It does require that offset correction ("Kentucky Windage") be applied for both range and wind conditions. The requirements for using the combat sight method are that -

(a) The helicopter be in coordinated flight (horizontal and vertical trim).

(b) The range be estimated within 100 meters.

(c) The proper amount of offset correction be applied.

B. FLEXIBLE SYSTEMS.

The sighting techniques for flexible weapons systems are similar to those for fixed systems. However, specific weapons, sights and sight displays will differ with weapons having high and low muzzle velocity.

(1) High muzzle velocity. Weapons with a high muzzle velocity have a relatively flat trajectory and are not affected by those ballistic factors associated with flexible weapons as much as low muzzle velocity weapons. This, in combination with the high rate of fire of flexible systems, eliminates the requirement for mil values on the sight reticle image. The procedures given below should be followed:

(a) Harmonize these weapons at their maximum effective range. Maximum effective range is dependent upon tracer burnout, volume of fire, and type of sight.

(b) Place the pipper on the target. Fire and observe tracer impact. Adjust weapons so tracers impact on the target. Due to the high volume of fire and the relatively simple sighting techniques, fire from this type of weapon is relatively accurate.