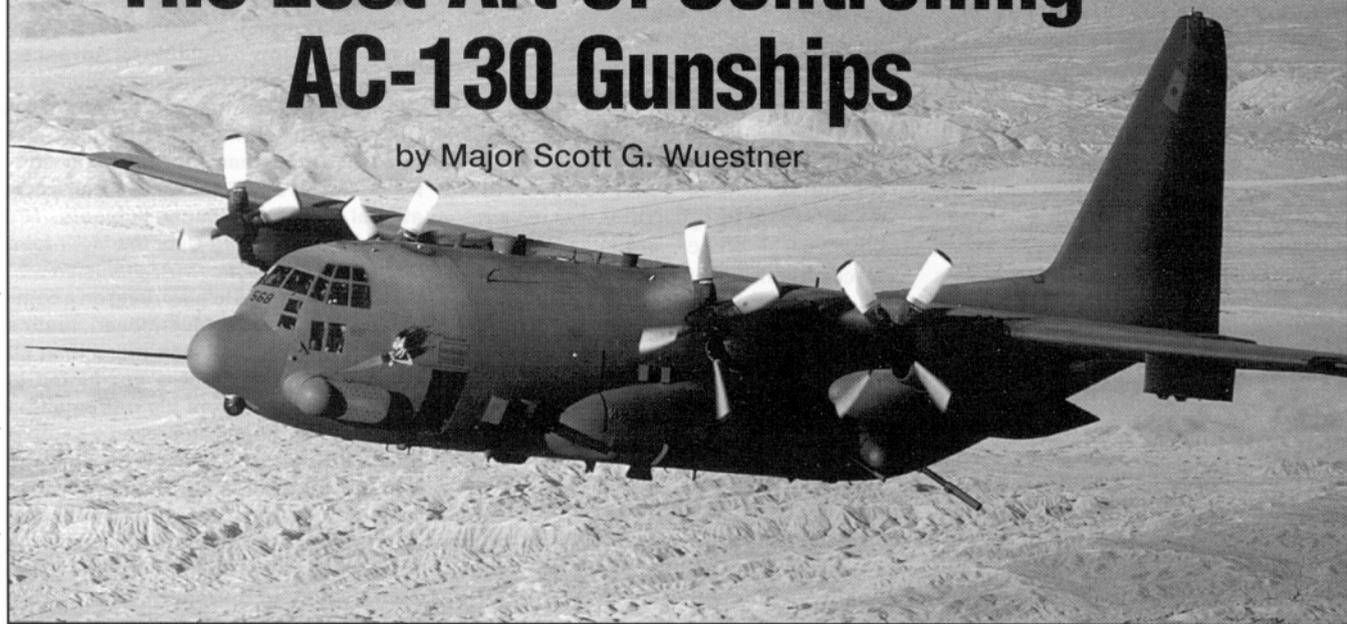


The Lost Art of Controlling AC-130 Gunships

by Major Scott G. Wuestner



The Air Force AC-130 gunship is one of today's premier close air support (CAS) aircraft. The gunships have demonstrated their ability to provide extended periods of CAS at night with great lethality from the war in Vietnam to Operation Just Cause in Panama to Operation Desert Storm in the Gulf.

However, conventional light forces haven't been able to fully develop tactics, techniques and procedures (TTP) for calling in the AC 130 in the close fight. The problem is attributed mainly to the lack of access and training time with the platform. The purpose of this article is to provide AC-130 call-for-fire (CFF) TTP and positioning and target marking procedures.

The AC-130 gunship procedures can be found in *Joint Pub 3-09.3 Joint Tactics, Techniques and Procedures for Close Air Support (J-CAS)*. The information in this article outlines TTP not addressed in doctrinal publications.

AC-130 Gunship Call-for-Fire

The AC-130 CFF is sent in two transmissions and contains five lines of information. (See Figure 1.)

Line 1—Observer/Warning Order. This line closely resembles the artillery CFF format. "Fire Mission" may be replaced by "Recce" when requesting enemy reconnaissance or use of the

gated light illuminator night television, called GLINT. The warning order may also include "Mission #1" and "Mission #2" if multiple missions are requested.

Line 2—Friendly Location/Position Marking. The observer must first identify his position by describing his location. He may use graphics on a map, visual "talk-on" CAS techniques, direction and distance from a target reference point (TRP), a grid location sent over a secure net, any other method or none.

To further identify his location the observer may use common day or night marking techniques. These are outlined below and are designed to work with each of the gunship's three sensors.

• **Position Marking—Infrared (IR).** The Q-17 infrared camera on the AC-130H and updated IR detection set on the AC-130U is a passive system that detects radiated heat and energy. It presents the image on a black and white television picture format in white or black hot polarity. Both sensors have a wide and narrow field of view. Their excellent position marking devices include space or thermal blankets. Also, position marks, such as smoke and heat tabs, easily identify the observer's location.

• **Position Marking—TV.** The low-light level television (LLTV) sensor in the H-model and all-light level television (ALLTV) sensor in the U-model amplify available light, such as starlight, and present it in a black and white television format. This means it's com-

patible with most ground laser pointers. The H-model TV has two fields of view: wide and narrow; the U-model also has a medium view. The GLINT is used only in permissive environments.

Excellent position marking devices for the TV sensor include the basic survival strobe, firefly and Phoenix strobes and red lens flashlight. The observer also can "rope" the aircraft by aiming the pointer at the gunship. ("Rope" is a J-CAS term used by the observer to identify his position for an aircraft.)

• **Position Marking—Radar.** The AC-130H has a limited adverse weather sensor: APQ-150 beacon tracking radar. This radar is an active India-band transponder and receiver that detects the PPN-19 and other beacons.

The AC-130U has the APQ-180 Strike Eagle radar. This radar gives the U-model an adverse weather capability. It can create high-resolution maps and detect and track moving vehicles during reduced visibility operations.

When employing any beacon to mark his position for a CFF, the observer turns the beacon on only to execute the mission and then turns the beacon off. This reduces the signature for the enemy's direction finding radar. If the observer uses radar reflectors, he must space them not less than 10 meters apart.

• **Position Marking—All Sensor Systems.** During tactical operations, the gunship will attempt to identify all friendlies prior to engaging targets. If

this is not practical and the gunship can engage targets when the friendlies are known to be clear. This concept is known as reasonable assurance.

Gunship crews normally operate under direct positive control before engaging; however, battlefield conditions may preclude this and attacks can be cleared under the joint force commander's (JFC's) established guidelines.

Line 3—Target Location. The preferred method is to reference a target in terms of direction (degrees magnetic) and range (meters) from the observer's position. The observer also may refer to the direction in terms of the eight cardinal directions. (The gunships have a fixed north indicator that provides rapid orientation). Direction should never be referred to using the clock method: "...at nine o'clock."

Targets also may be described using visual talk-on CAS techniques, such as giving a direction and distance from the TRP to the target or building to the target. Additionally, grid coordinates may be used.

Line 4—Target Description and Target Marking. The target description aids in both identification and crew weapon selection. At a minimum, the description should cover what the target is, what it's doing, its size and degree of protection. The observer should not try to describe the target by color.

The observer has many options in marking a target for the gunship. Tracers from direct fire, flares or 40-mm rounds all provide a reference point for visual talk-on techniques. (Note that it isn't a requirement to mark the target to conduct a fire mission successfully.)

• **Target Marking—IR and TV.** The most common marking technique is to

use IR pointers or "Sparkle" with the TV sensor. "Sparkle" is the doctrinal term for marking a target with an IR laser pointer. IR pointers are limited to favorable environmental conditions. Temperature, humidity, fires and smoke all degrade pointer operations. Additionally, ambient light is a key planning factor in deciding whether or not to use an IR pointer mark.

• **Target Marking—IR Pointers.** Historically, IR pointers perform directly proportional to their power output. Weapon-mounted pointers, such as the AIM-1 and PAC-4 Charlie, are 30-milliwatt pointers and generally have a range out to two kilometers. The 50-milliwatt pointers (air commander's pointer) or 100-milliwatt pointers (GCP-1 B) perform out to three kilometers with greater clarity for the gunships. Using the pulse setting on an IR pointer or focusing the beams of two pointers on one target to produce an inverted "V" enable the gunship to quickly identify a target.

When sparkling a target, the FO normally won't mark the target until the gunship requests it. (Note: this is the same procedure used in marking targets for faster-mover CAS.) This reduces the observer's exposure with the IR device. When commanded to "Mark Target," the observer walks the IR pointer from his position to the target. It's important to mark the base of the target to reduce IR pointer spillover. This technique reduces the gunship's target identification time and the observer's vulnerability.

Also, to deconflict multiple pointers (i.e., maneuver control versus fire support CFF), it's critical the gunship pilot can clearly identify the observer's position (building two, battle position one, etc.).

If required, "At My Command" (AMC) will be included at the end of the second transmission as part of Line 4. The navigator will tell the FO that the gunship is prepared to fire by stating, "Ready to Fire."

The FO will command the gunship to fire by saying, "Fire."

Line 5—Remarks. Flight hazards, changes in antiaircraft threats and requests for special munitions and engagements is provided to the gunship. If required, the observer requests a time-on-target or danger-close mission on this line.

Execution and BDA. A properly authenticated transmission of the AC-130 CFF gives the crew clearance to fire. The observer does not have to clear the gunship "Hot." However, the gunship retains the right to request specific clearance to fire at any time, particularly when the mission is danger close (125 meters for 20-mm, 25-mm and 40-mm; 200 meters for 105-mm).

The goal of the gunship is first round fire-for-effect (FFE). The observer should only adjust marking rounds or for an incorrect target. Corrections are given using one of the eight cardinal directions and distance (meters) from the impact of the last rounds to the desired target. "Rights" or "lefts" are not used. If the rounds are on target, the observer immediately states FFE to the gunship.

The gunship will end the mission when the desired results are achieved. Battle damage assessment (BDA) always will be sent to the observer from the gunship. The observer can request continued effects or end the mission at any time.

AC-130 Crew Procedures

Once the observer has completed his transmission of the CFF, the gunship crew begins its target engagement procedures. A typical mission begins when the navigator establishes communications with the ground party and the CFF or reconnaissance mission is sent. Simultaneously, the sensor operators begin to locate the observer's position with the TV, IR or beacon tracking radar.

The fire control officer (FCO) inputs the direction and distance from the friendlies to the target into the computer or he enters the grid if sent. The FCO then directs the TV, radar or IR sensor to act as primary fire control for the en-

1st Transmission

Line 1. Observer/Warning Order: "[AC-130], this is [FO]. Fire mission, over."

2d Transmission

Line 2. Friendly Location/Mark: "From my position, [target reference point, building, grid, other or none] marked by [IR strobe, beacon, etc. or none]."

Line 3. Target Location: "[Degrees magnetic/range in meters, target reference point, grid or other]"

Line 4. Target Description/Mark: "[Target description] marked by [IR pointer, tracer, other or none], over."

Line 5. Remarks (If Required): "[Threats, effects required, danger close, time-on-targets, etc.], over."

Figure 1: The Ground Observer's AC-130 Call-for-Fire. This CFF has two transmissions and includes five lines of information.

gagement. The remaining sensor moves (“slaves”) to the other sensor’s position and follows the mission or maintains its observation of the ground party.

If an IR pointer is used, the TV follows the walk of the pointer from the observer to the target. This occurs upon the command of “Mark target” from the gunship. Once the target is positively identified, the FCO announces the distance from friendlies and any “No fire” headings in place. Once again, he confirms the primary fire control sensor and identifies which weapon system will engage the target.

The gunner, as directed, prepares the appropriate weapon system and announces, “Ready.” The navigator then confirms all firing data and clears the crew to fire. The pilot/aircraft commander gives his consent while the sensor operator provides final consent and fires the weapon. The crew then assesses the effects and relays the target’s status or BDA to the ground controllers.

The most common types of fire missions are the CFF with no mark (see Figure 2), the CFF with IR “Sparkle Mark” (see Figure 3) and the CFF using GLINT.

Observer: “Spooky 22 [AC-130U] de B14 [FO]. Fire mission, over.”

Gunship: “B14 de Spooky 22, fire mission, out.”

Observer: “From my position at BP 2, marked by IR strobe, 245 degrees, 1500 meters, V-150 moving south on Highway 17. No mark, over.”

Gunship: “Read back [pilot repeats observer CFF details], out....Round away, over.”

Observer: “Round away, out....Southwest 200 meters, V-150 is now behind building. FFE, over.”

Gunship: “FFE, out. End of mission, V-150 destroyed. Estimate three casualties, over.”

Observer: “End of mission, out.”

Figure 2: CFF—Direction and Distance, But No Mark

Observer: “Spectre 45 de B14. Fire mission, over.”

Gunship: “B14 de Spectre 45. Fire mission, out.”

Observer: “From my position at building four, marked by beacon, 125 degrees, 600 meters. BTR [tracked reconnaissance vehicle] on east side of building marked with sparkle, over.”

Gunship: “Read back [pilot repeats observer CFF details], out....Mark target, over.”

Observer: “Mark target, out.” [Observer sparkles target.]

Gunship: “Rounds away, over.”

Observer: “Rounds away, out....FFE, over.”

Gunship: “FFE, out. End of mission, BTR destroyed. Estimate four casualties, over.”

Observer: “End of mission, out.”

Figure 3: CFF—Direction, Distance and IR Pointer Mark

Observer: “Spooky 22 de B14, recce, over.”

Gunship: “B14 de Spooky 22, recce, out.”

Observer: “From my position marked by space blanket, burn west 800 meters, suspected enemy vehicles, over.”

Gunship: “Roger, out.” [Gunship turns on GLINT.]

Observer: “Roll burn 400 meters south, over.” [Gunship begins to roll burn.]

Observer: “Freeze burn, over.” [Gunship stops moving burn.]

Observer: “Trucks are in northwest corner of burn. FFE, over.”

Gunship: “Roger, I have the target. FFE, out....End of mission, trucks destroyed, over.”

Observer: “End of mission, out.”

Figure 4: Reconnaissance Mission Using GLINT

Use of GLINT. The gunship’s GLINT can be used in a variety of roles, either preplanned or on-call. GLINT is referred to as “burn.” When moving the burn, the observer directs the gunship to “roll burn” in a specific direction (cardinal or degrees) and distance (meters). He doesn’t tell the gunship to roll burn in units or by the size of the burn on the ground.

The observer can have the gunship stop moving the burn by stating “Freeze burn.” If the observer wants the gunship to turn the burn off, he states, “Stop burn.” (See Figure 4 for procedures for a reconnaissance mission using GLINT.)

No-Comms Missions. No-communications CFF procedures require extensive preplanning with a gunship planner. Missions in all cases are still sent to the gunship “in the blind.” Common techniques include two methods:

- *Method 1.* The observer turns on a beacon, such as the PPN-19, and provides a visual target mark, such as direct fire or sparkle.

- *Method 2.* The observer ropes the AC-130 to identify his position and then walks the sparkle from his location to the target.

In all cases, the gunship engages targets until the required effects are achieved.

The future holds many diverse missions for our light and heavy forces. Our observer teams must know how to employ all assets in order to be successful.

Unfortunately, not all fire supporters have the opportunity to work with AC-130 gunships. The AC-130 TTP in this article provide a foundation for FOs to control AC-130 gunships.



Major Scott G. Wuestner develops and tests fire support tactics, techniques and procedures (TTP) and equipment for the Special Operations Command at Fort Bragg, North Carolina. He has six years of experience working with gunships. His other fire support officer (FSO) and related experience include serving as a FSO Instructor for the Field Artillery Officer Basic Course at the Field Artillery School, Fort Sill, Oklahoma; Battalion FSO for the 2d Battalion, 75th Ranger Regiment at Fort Lewis, Washington; and Battalion FSO for the 3d Battalion, 17th Infantry, 7th Infantry Division (Light), Fort Ord, California. He participated in three rotations as a task force FSO at the Joint Readiness Training Center, Fort Polk, Louisiana. Major Wuestner commanded A Battery, 5th Battalion, 15th Field Artillery, 7th Infantry Division (Light).