

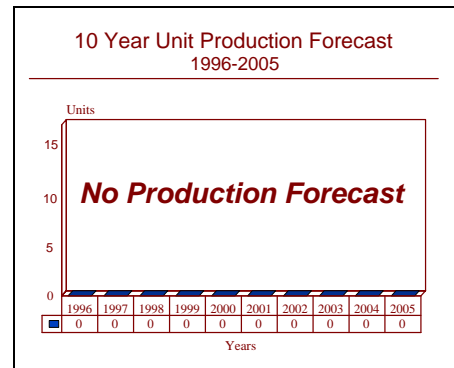
# ARCHIVED REPORT

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## ULQ-19(V)/RACJAM - Archived 6/97

### Outlook

- Production and US/UK service
- New EW systems will begin to replace by end of decade
- Continued need for support and some procurement



### Orientation

**Description.** An automatic, mobile VHF tactical communication jamming system.

#### Sponsor

US Army  
Army Communications-Electronics Command  
(CECOM)  
C4IEW Acquisition Center  
Night Vision & Electronic Sensors Directorate  
Ft. Monmouth, New Jersey (NJ) 07703-5000  
USA  
Tel: +1 201 532-2534

#### Contractors

Racal Communications Inc  
5 Research Place  
Rockville, Maryland (MD) 20850  
USA  
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(Prime design/production)

**Status.** In production, in service with the US and British Army, ongoing logistics support.

**Total Produced.** An estimated 195 units have been produced.

**Application.** This is a battlefield jammer that can be deployed quickly to meet the need for fully automatic, mobile jammer systems operating in the VHF band.

**Price Range.** Estimated unit cost is approximately US\$100,000.

## Technical Data

### Characteristics

#### ULQ-19

##### Power

Ground system:	100 W
Ground system:	250 W
Airborne system:	100 W
Frequency Range:	VHF 20 to 30 MHz
Target channel preselects:	16
Channel spacing:	12.5 kHz
MTBF:	568 hr
MTTR:	1 hr

#### RACJAM-V

##### Power

RJS3100:	100 W
RJS3101:	2 kW
RJS3102:	200 W
RJS3103:	4 kW
Frequency range:	20 to 80 MHz
Target channel preselects:	16
Channel spacing:	25 kHz
Frequency stability:	± 5 ppm

**Design Features.** The ULQ-19(V) is Racal's RJS-3100 Responsive Jammer adapted for use by the US armed forces. It was designed to be a rugged, high-quality, versatile battlefield jammer capable of rapid deployment in the most adverse military environment and able to meet the need for a fully automatic, mobile jamming system covering the 20-30 MHz band.

Primary RACJAM components include the ULQ-19(V), a RA-1796 receiver, and the MA-1119 signal display unit. All the components are shock-mounted in two cases, which can be rapidly installed in a helicopter. If installed onboard UH-1 or UH-60 helicopters, there is no need to modify the primary power or RF distribution systems.

The MA-1112 control and display unit directs the system. It includes a keyboard for entering instructions, an internal clock for timing jamming periods and intervals, and a display for showing channel data and signal activity. It uses three channels for various modes of operation.

The jammer channel stores up to 16 priority-rated target frequencies, and a signal threshold above which jamming is initiated. The communications channel stores particulars on up to four frequencies for communications with the control station. The protected channel contains details on friendly frequencies where jamming is restrained when the system is in the "band" mode.

The ULQ-19(V) uses two PRM-4090 VHF transceivers for receiving, jamming and communication operations, and both also act as search receivers. When transmitting, the output of one transceiver is fed into a 100- or 250-watt linear amplifier, and from there to either a whip antenna with a suitable matching unit or a wide-band, high gain, log-periodic antenna. When a tuned transmit antenna is used for jamming, a second wide-band whip antenna is used for receiving.

An MS-4280 modem links the system to a printer and keyboard unit. The MA-1017 vehicle interface unit allows connection with the system's other hardware and houses the noise generator for modulating the jamming signal.

**Operational Characteristics.** The jammer can be programmed to constantly search through a preset list of 16 adversary frequencies, take the highest priority target found operating at any given time, and jam it within one second. It can also scan-search a specified band of frequencies and jam enemy transmissions encountered when they are found to be above a preset signal level.

Depending on the individual transmit-to-receive ratios of the target nets, simultaneous disruption of several nets is possible, since jamming occurs only when targets are active. Threshold levels can be set to avoid false triggering, and there is the ability to automatically protect one's own operating frequencies.

MODES OF OPERATION:

Automatic Jamming Mode. Initially, both transceivers perform a search of the 16 target frequencies and four communications channels stored in the memories. Any active channel encountered is automatically jammed on a priority basis, typically within one second. The transceivers continue searching on other target frequencies and communications channels by an automatic "look-through" procedure whereby jamming is interrupted at brief random intervals.

If activity is found at any time on a communications channel, jamming ceases and the system locks onto the active frequency with the operator can change to a "comms" mode for two-way communication with the station using voice or data.

Dedicated Single-Frequency Jamming. In this mode the operator can choose any single frequency, including the stored frequencies for jamming when active.

Passive Search. The jam feature is shut down and the receivers scan-search the 16 target channels with signal levels displayed for each active channel.

Communications. This enables the operator to communicate with the control station while at the same time inhibiting jamming.

Since the system is compact and rugged, it is easily mounted in a small soft-skinned or armored vehicle (either as a permanent fixture or on a removable pallet). Set-up and take-down time is about five minutes, allowing quick movement to prevent enemy direction finding and attack.

Helicopter installation is an option that makes for flexibility and increased range because the platform is higher, extending the jamming horizon.

Another option is to install the system on a Remotely Piloted Vehicle (RPV). Because it can get closer to a target, this technique provides the added advantage of being able to use an output power as low as 10 W and have an operational effectiveness equal to that of a well-sited, 1-kilowatt, ground-based system. Target data are provided to the RPV-mounted jammer by the MA-1112 serial data interface, which uses the secure ground-to-air link that provides flight control.

## Variants/Upgrades

ULQ-19(V)1 is a 100-watt VHF system designed for vehicular installation, along with whip antennas, and can be used on the move.

ULQ-19(V)2 features a power of up to 250 watts. The original requirement was for 400 watts, but because of power drain limitations and other factors, the requirement was reduced. It is vehicle mounted.

ULQ-19(V)3 is the helicopter-borne version and is also called HACJ (Helicopter-Appiqué Communications Jammer) or "Hawk." This HF/UHF/VHF version is designed to provide communications jamming over the frequency range of 20 MHz to 79.975 MHz, and a signal intercept and surveillance capability over the 2 MHz to 1 GHz frequency range.

## Program Review

**Background.** The ULQ-19(V) replaced the TLQ-17 in Marine Corps service, and the Army used ULQ-19s to supplement its TLQ-17As. The Marine Corps' TLQ-17s were first fielded in 1971 but had reliability and maintainability problems, with an MTBF of eight hours and MTTR 57 days.

The ULQ-19(V) has a mean-time-between-failure of 568 hours, a mean time to repair of one hour, comes with a warranty, and is lightweight and reliable. The Marine Corps has procured about 39 systems, including 12 as part of the Mobile EW Support System (MEWSS). Radio battalions field 12 each.

Besides the ULQ-19(V)2, the MEWSS includes a PRD-10 direction finder, a WJ-8618B intercept receiver, two RT-246 VHF radios, and a PRC-104 radio. MEWSS will supply Marine tactical commanders with responsive,

mobile and survivable EW support during amphibious assault missions and follow-up shore operations. The Marines may procure the ULQ-19(V)3 in the future.

Systems have been procured by Canada and the British are procuring the RJS-3100 version which has been fitted for onboard Land Rovers and formed into a new EW troop. The most recent customer for the RJS-3100 is the Republic of Korea.

According to Racal, the RJS-3100 has been battle tested, probably in the Falklands. The US used the ULQ-19(V) during the "Urgent Fury" operation in Grenada in 1983 and Operation Desert Storm.

The US Army has fielded about 70 systems as a more mobile supplement to the TLQ-17A. It has 12 ULQ-19(V)3s for helicopter use. A 1989 order for 22 systems was for Army Reserve applications. One of the

Army units fielding the ULQ-19 is the 313th Military Intelligence Battalion.

In late 1992, the Army released a Market Survey to locate additional sources for the Receiver-Transmitter RT-1503/ULQ-19. The release noted a requirement of eight units and said award to Racal UK was possible.

Army Modernization Plan. In January 1993 the Army released its *Modernization Plan*, a 17-volume document which lays out the Army's plan for reshaping and re-equipping its forces for the future battlefield. Annex I highlighted the Army's plan for Intelligence and Electronic Warfare (IEW) and how it will support the Army's five modernization objectives and the Vision of LAND FORCE DOMINANCE. The IEW Annex outlined the details and rationale for the major programs that are key to achieving the Modernization Vision. These efforts will support:

- Winning the Information War
- Protecting the Force
- Conducting Precision Strikes
- Dominating the Maneuver Battle

Based on lessons learned in Operation Desert Storm, the Army found that its IEW force lacked versatility and

balance. Processing and communications capabilities are inadequate, and deployability is limited. Sensor technology is 15 to 25 years old and does not have the needed frequency range, a precise targeting capability, and could not exploit many modern modulation techniques. The platforms are also very support/maintenance-intensive and the number needed to support field forces can be a strain on available air and sea lift capacity.

In its plan, the Army noted that during the next decade military forces in many regions will increase their combat capability by acquiring increasingly sophisticated weapons and communications equipment. US forces must be prepared to face a broad array of systems and capabilities. As a result, the Army will have to upgrade older systems or add new, leading-edge systems to its inventory.

The major improvements in EW/SIGINT capability are envisioned to be fielded during FY96 through FY99. The new systems will have an open architecture and modular design. Precision and capability will be significantly improved; as will mobility, deployability, balance, and supportability. Keys to this will be fielding the Guardrail Common Sensor, Advanced Quick Fix, and Ground Based Common Sensors, as well as TACJAM-A.

## Funding

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Funding is from Operations & Maintenance accounts.

Analysis. The ULQ-19(V)/RACJAM is small, light, and flexible – important features for front-line equipment. It is rugged, reliable and relatively simple to operate. During the Persian Gulf War, nearly every EW asset in the inventory was used. The success of EW was highlighted by reported statements from Iraqi POWs. One captive commander said that because of jamming he had not heard from his headquarters in over three weeks.

Newer systems with more advanced processing and automation have not yet proven themselves to some potential customers. Although the Army Modernization Plan is developing its Intelligence and Electronic Warfare

Common Sensor (IEWCS), the ULQ-19 should continue to be used as an adjunct jammer for front-line units. RACJAM will remain popular with British units.

The Army's new Battle Force XXI concept emphasized the electronic battlefield. It will rely heavily on linkages between units and individuals for effective operation. The concept will call for an ability to deprive hostile forces of doing the same; using a variety of advanced, capable SIGINT, ELINT, and jamming equipment. Offensive advances will be accompanied by defensive advances through new equipment as well as upgrades to older systems.

## Recent Contracts

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No recent DoD contracts over US\$5 million recorded.

## Timetable

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	1980	Production commenced
Dec	1983	First unit equipped, 20 systems procured. ULQ-19 deployed by US ground

Jan	1984	forces in the invasion of Grenada Approved for Marine Corps fielding by Assistant Commandant of the Marine Corps
Sep	1984	ILS management team established
	1986	ULQ-19(V) chosen to form part of the MEWSS system
Mar	1990	Contract for Heliborne Appliqué Communications-Jammer (HACJ) established
4Q	FY92	Delivery of full provisioning parts list (spares)
2Q	FY93	Type classification
3Q	FY93	Delivery of HACJ full provisioning parts list
3Q	FY94	Transition to Level III Management

## Worldwide Distribution

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The system is used by the **United States, Canada, Britain, and the Republic of Korea.**

## Forecast Rationale

System flexibility and affordability, and a good reputation, will ensure a continued need for support and some procurement. Newer systems capitalizing on increased miniaturization and more powerful processors are beginning to be fielded.

Maintaining ULQ-19(V) equipment in a backup inventory will create a spare/repair parts market through most of the decade. By the end of the decade, new systems will begin to replace many currently fielded EW assets.

## Ten-Year Outlook

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No further production expected.

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