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River and Canal Ambush Problems, Republic of Vietnam, 1962 (U)

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SOUTHEAST ASIA FIELD OFFICE
Project AGILE
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Published April 1963

River and Canal Ambush Problems, Republic of Vietnam, 1962 (U)

by
James W. Johnson

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PREFACE

This study was undertaken as an inquiry into one potentially significant aspect of the ambush problem in Vietnam. It is the second paper in a series. In a very short time the author surveyed the problem, assembled data and observations from diverse sources, and arrived at some specific and general conclusions. He demonstrates clearly that the "ambush" problem has not been critical but that it easily could be.

The fragmentary nature of the data bearing on the problem of river and canal incidents underscores the provisional nature of the conclusions. Even so, a major contribution is made in categorizing the facets of the overall problem and assessing which areas offer potential payoffs to R&D, including operations research, considerations.

The author has stressed the tentative nature of his conclusions and the tenuous nature of some of the data; it must be observed parenthetically that the data problem is not unique to rivers and waterways. He has accomplished a signal service by establishing an approximate date at which quantitative information of a reliable quality began to become available and by presenting these data for analysis. It is hoped that the paper will provoke comments and increased interest in the problem of armed incidents on navigable waterways.

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ACKNOWLEDGMENTS

The author takes full responsibility for the contents and especially for the conclusions and recommendations in this study.

It is appropriate, however, to acknowledge the advice and assistance given in obtaining available data. All the individuals mentioned are US Navy officers.

LCdr Richard Chesebrough, Senior River Force Advisor, Republic of Vietnam Navy, and member of the Navy Section, United States Military Assistance Advisory Group, Vietnam, was especially helpful. Additional advice and data were provided by Capt J. B. Drachnik, Chief of the Navy Section, and LCdr P. W. Koehler, Section N2.

Cdr J. L. Thornton, in the J2 Section, United States Military Assistance Command, Vietnam, provided voluminous data on Viet Cong (VC) activities along the RVN waterways, including information available in his personal file. Cdr H. J. Ursettle in the J3 Section sought out and made available (in much appreciated air-conditioned space) the voluminous files on RVN operations, as reported by US advisors.

Cdr W. L. Thede of the Combat Development Test Center, Vietnam, assisted in getting the investigation under way by uncovering sources of information, and, as coauthor of the "Junk Blue Book," provided most interesting and useful data on indigenous river craft.

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SUMMARY

PROBLEM

To establish the relative importance of the past and possible future river and canal ambushes as employed by the Viet Cong (VC) guerrillas against the Republic of Vietnam (RVN) armed forces.

To examine guerrilla tactics and techniques in river and canal ambushes, and current countermeasures employed.

To examine and propose possible tactical and technical countermeasure improvements and possible research and development (R&D) action to permit such improvements.

FACTS

An ambush is a basic-type action in guerrilla tactical doctrine and occurs in the countryside, on highways, railroads, and navigable waterways.

In the RVN there are 4600 km of navigable waterways—rivers, canals, rachs, and arroyos. Of these over two-thirds are located in the southern tip of the country, in the Mekong River Delta region. Asphalted roads are almost exactly equal in length to the navigable waterways in the same area. Sixty-four percent of the population, or 9.1 million, live here, of which about 85 percent, or 7.7 million, are rural-area dwellers.

In the same region, during the year 1962, VC guerrilla-initiated incidents equaled about 53 percent or 10,088 of the total of 18,899 for the whole country, and of a total of 5484 VC-initiated armed attacks, 73 percent or 4058.¹

Some 57 percent of the "accepted-identified" guerrilla forces out of a total of 23,000,* and 53 percent of the "tactically deployed" RVN forces out of a total of 182,000 (both estimates as of October 1962), were listed as being in the "tactical zone" of which the region constitutes a major part.

Of an estimated 80 percent of reported VC waterways activities (137 in 4½ months, 20 VC guerrillas or over), 90 percent were located in the Delta region. In an incomplete but significant spot check of 40 RVN operations 45 percent took place in the region, and in 50 percent of these at least some river craft were employed. (In 40 percent, helicopters played a major role.)

In the tactical zone of principal interest, during a period of 10 months (March to December 1962) the 41 VC-perpetrated river-boat incidents reported

*A "generally accepted" (by USMAC-V, J2, and RVN sources) additional 100,000 qualify as part-time VC guerrillas or active supporters; perhaps as few as one-third are equipped with firearms.

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SUMMARY

constituted only about 1 percent of all armed incidents; and only about 0.2 percent of the armed incidents are classified as ambushes as defined in this paper.

DISCUSSION

The availability of data is limited by the apparent relative infrequency of river and canal incidents and ambushes during 1962. In addition, all types of data were limited prior to about July 1962, at which time US advisory activities were stepped up and appeared to be responsible for an increase in information received from RVN sources.

The ambush is a basic guerrilla tactical activity. At the same time, as a percentage of the total VC-initiated incidents and VC-perpetrated armed attacks, the number of river and canal ambushes has been small. Presumably this has been due at least in part to the lack of a larger number of the kinds of opportunities that would appear to be advantageous to the VC. Presumably the threat of ambushes has had its effect. The use of helicopters and the relatively infrequent use of river craft only in RVN operations are measures of ambush avoidance.

A case is made for a possible change. The area of primary interest and concern, in general the Mekong River Delta region, is simultaneously the area of greatest VC activity and control, highest percentage of RVN operations involving river craft, highest incidence of navigable waterways, and highest density of population and rural dwellers. In the course of pacification of the region, and after it is achieved, the rivers and canals will constitute primary routes of movement and control.* In the first of these periods it is possible that the incident rate of ambushes, and therefore the associated problems, will increase to a level of considerably greater importance.

By the definition used in this study, relatively small, unsupported, and usually isolated mining, sniping, and harassing incidents do not qualify as ambushes. Those of interest are well planned to achieve surprise; employ stealth, camouflage, and dense cover; involve a large volume of fire from a variety of weapons at the outset; cause maximum casualties during a short period of at most a few minutes; and use ancillary techniques such as barricades, mines, and booby traps to destroy selected craft and impede and disrupt the movement and operations of the unit attacked.

The VC guerrillas have employed, and presumably will continue to employ, a variety of weapons and techniques notably lacking in modern sophistication but used with considerable ingenuity. They include all types of small arms, grenades, machineguns, mortars, recoilless rifles, homemade "launch bombs," "bazomines," "depth charges," floating charges, and waterway barriers.

*Assumptions based on current RVN (and US) objectives.

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SUMMARY

Five general categories of measures and countermeasures have been selected for consideration: prevention, inhibition, detection, survival, and destruction.* The single panacea for the river and canal ambush problem, actual and potential, is the successful pacification of the area of major interest, and this is a political and economic as well as military problem. In the course of achieving military success, most of the listed measures and countermeasures can be improved to advantage; a number appear to be special candidates for R&D and operational testing.

CONCLUSIONS

1. During 1962, VC-perpetrated river and canal ambushes have had little destructive effect on RVN armed forces.
2. The threat of ambushes, in conjunction with other factors such as the degree of control exercised by the VC in the Mekong River Delta, inhibits, impedes, and prevents normal use of major commercial traffic routes, military supply and support, and conduct of pacification operations.
3. Pacification operations of a size and aggressiveness adequate for ultimate success in the region can be expected to increase traffic on the waterways, increase the opportunities for ambushes, and thus increase the importance of seeking improvement in appropriate measures and countermeasures.
4. Measures and countermeasures are listed and examined under the heading of prevention, inhibition, detection, survival, and destruction. Prevention includes area control, airborne operations, and counterintelligence. Inhibition involves deception, defoliation techniques, air cover, and escort; singled out for special concern are barricade removal, antimine techniques, and ambush-pattern analysis. Detection solutions include intelligence, search-and-clear operations, and reconnaissance by fire; more sophisticated techniques including photography and electronic and other sensory devices hold theoretical promise, but with great uncertainty given the characteristics of the target. Survival of effective onset fires in particular involves possible improvements in organization and vehicle design including armor protection, damage control, and use of semiautomatic suppressive fires. Destruction of the ambushing unit involves improved retaliatory fires, aggressive frontal counterattack, encirclement and pursuit tactics and techniques, and more rapid arrival of reinforcements.
5. If given appropriate orientation for river-craft operations, R&D projects already under way in connection with other operational requirements, including those of highway ambushes, will assist, and may in large measure satisfy, waterway ambush requirements. They are identified under the recommendations. It was beyond the scope, or at least the capability, of this study to determine whether sufficient effort is now being given to R&D

*For a detailed display of the elements of these categories see Table 2.

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SUMMARY

and procurement to improve the categories of measures and countermeasures listed above.

RECOMMENDATIONS

The following river and canal ambush problems are recommended for appropriate R&D, engineering, and operational field test effort. Projects with similar objectives, already under way in connection with highway and railroad ambush problems, should be expanded or oriented as necessary to include the following:

- a. Barricade removal.
- b. Antimine operations, including detection, sweeping, and destruction.
- c. Vehicle design, with additional protection primarily against small-arms fire.
- d. Suppressive and retaliatory fires, with emphasis on semiautomatic use of flame, multiple-grenade launchers, chemicals including smoke, and delayed-action fragmenting ammunition.
- e. Encirclement fires, including those for suppressive and retaliatory measures, but extended in range as necessary, including persistent effectiveness sufficient to hold ambushing units in place.

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**RIVER AND CANAL AMBUSH PROBLEMS,
REPUBLIC OF VIETNAM, 1962**

ABBREVIATIONS

ARPA	Advanced Research Projects Agency
ARVN	Army of the Republic of Vietnam
CDTC-V	Combat Development Test Center-Vietnam
CG	Civil Guard
CIA	captured in action
HE	high explosive
KIA	killed in action
LCM	landing craft, mechanized
LCVP	landing craft, vehicle, personnel
MIA	missing in action
OSD	Office of the Secretary of Defense
PW	prisoner of war
R&D	research and development
RVN	Republic of Vietnam
RVNAF	Republic of Vietnam Armed Forces
SDC	Self Defense Corps
SSB	swimmer-support boat
UTM	Universal Transverse Mercator grid
USMAAG-V	United States Military Assistance Advisory Group-Vietnam
USMAC-V	United States Military Assistance Command-Vietnam
VC	Viet Cong
WIA	wounded in action

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INTRODUCTION

PROBLEM

To establish the relative importance of the past and possible future river and canal ambushes as employed by the VC guerrillas against the RVN armed forces.

To examine the guerrilla tactics and techniques in river and canal ambushes, and current countermeasures employed.

To examine and propose possible tactical and technical countermeasure improvements and possible R&D action to permit such improvements.

DEFINITION

The ambush is a basic-type action in guerrilla tactical doctrine. It is employed by both small and large guerrilla units against counter guerrilla forces that are frequently superior in number and firepower and not normally in an aggressive posture. Such actions occur in the countryside, on the highways and navigable inland waterways, and on the railroads. Characteristically, ambushes are usually preplanned attacks to attain maximum surprise; include the maximum use of stealth, camouflage, and cover; involve the employment of all available firepower at the outset in an attempt quickly to disperse and annihilate the enemy; and use ancillary techniques such as mining, booby traps, and railroad rail removal to destroy lead or especially effective defensive or offensive elements and impede movement. The ambusher usually presses home the attack as long as he appears to have a decided advantage; then he attempts to retire rapidly along preplanned routes and disappear. By this definition, unsupported and usually isolated mining incidents, rail removals, and sniping or harassing fires do not qualify as ambushes.

GENERAL SITUATION

Introduction

This study concludes that at present river and canal ambushes are relatively infrequent and of minor importance in the RVN theater of operations. It is possible and reasonable to anticipate that the general situation could change in the future, and such ambushes could become of greater significance. The current relatively low frequency of occurrence appears to be due in part to the small number of opportunities offered the VC guerrillas; and the threat

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of ambushes and the VC-installed barricades are presumed to have reduced the use rate of the navigable waterways.

Selected RVN Population, Highway, Railroad, and Waterway Statistics*

The data on population distribution, highway types and lengths, railroad lengths and usage, and navigable waterways are included to provide a background for general understanding. In addition, emphasis is given to the regional distribution of possible future patterns of river and canal ambushes as well as current activities.

Of the total population of 14 million, about 9.1 million, or 64 percent, live in the region of the Mekong River Delta. Almost 95 percent are either in the Delta region or are coastline oriented. Rural areas claim almost 12 million, or about 85 percent, and most live strung out on the rivers and canals and along the coastline. Of the 2.4 million who populate the chief towns, over half (1.4 million) are concentrated in Saigon.

Navigable waterways have a total length of 4600 km. A regional estimate would place over two-thirds of this length in the Mekong River Delta. Data on military operations show that better than 55 percent of guerrilla incidents also have occurred in this region.

For comparison, as of 31 Dec 61 the RVN as a whole had a length of asphalted highways just equal to navigable waterways. It also possessed about 5400 km of crushed-stone-surfaced roads and 6300 km of earth-surfaced roads usable over 6 months of the year. The total roads equaled about 16,000 km.

In the Mekong River Delta, navigable waterways are in length equal to 70 percent of the surfaced (asphalt and crushed stone) roads and about 50 percent of all roads.

Roads are costly to build and maintain. Over \$400 million VN, or, depending on the choice of exchange rate assumed, over \$500 million US equivalents were expended annually. No funds were listed going into the upkeep of navigable waterways, although there is evidence of need to combat silting.

As is indicated in App A, available data on vehicles are open to question or at least to interpretation. Road-bound vehicles "in use," and nonmechanical vehicles "having paid the tax in 1961" (including bullock carts and hand carts) totaled about 143,000. If the Vietnamese press is correct, an even larger number are on the 30 km of streets in Saigon alone.

The total number of registered (as of 31 Dec 61) miscellaneous craft, junks, barges, and sea craft was 58,249. However, somewhat ambiguously, the official government document² observes that "these figures must be reduced by 50 percent for destruction due to the war circumstances." The same notation appears in the 1958-1959 statistical report.² In any event the number of craft is a rough estimate of the value of waterways and coastal areas used as traffic routes.

Railroads, by comparison, running mainly between the ports of Saigon, Nha Trang, Qui Nhon, and Da Nang, had a total length of 1391 km in 1961; this is essentially unchanged today. Passengers carried (2.58 million) and metric tons transported (411.5 thousand) cannot, for lack of data, be compared with other means of transport.³

*See App A for a full display of these statistics.

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In summary, the region of highest population density and waterway as well as road density is the probable region of greatest importance for river and canal ambushes.

Theater and Corps Statistics

Only very preliminary steps have thus far been taken to establish a total context of military operational statistics in the RVN against which to measure and more fully understand such smaller problems as ambushes. The establishment of such a context is beyond the scope of this study. However, some of the statistical highlights are mentioned, applicable to the same general period during which the ambush data are available. The risk of some distortion is accepted. For convenience, in part by virtue of the periodicity of the data reporting system, the information is centered on the month of October 1962. Variations occur from month to month; however, these do not appear to have exceeded 10 percent in any significant category during the 6-month period June-December 1962.

The data encompass the whole of the RVN; the theater is subdivided into three corps areas: I, II, and III.* Attention is called to the fact that throughout this paper the III Corps area is of primary interest; it contains most (over 90 percent) of the river and canal area in the southern part of the RVN, the Mekong River Delta generally south of Saigon. All numbers are rounded to two or three significant figures as appropriate.

As of 31 Oct 62 the RVN military forces "assigned" numbered about 380,000.² These are divided into three categories: 210,000 Republic of Vietnam Armed Forces (RVNAF), including the Army of the Republic of Vietnam (ARVN), the Air Force, the Navy, and special groups including Rangers and the Airborne Brigade; about 76,000 Civil Guards (CG) (or Bao An) and about 95,000 Self Defense Corps (SDC) (or Dan Ve). About 85 percent were given as "present," or about 328,000. At the same time, the "accepted-identified" VC guerrilla forces number 23,000.⁴ The overall ratio is thus 14.2.

Data of interest are listed in Table 1 for the theater and the three (tactical) corps zones.

The data in Table 1, as noted, are highlights only, not the complete picture.† They do focus attention, as they are meant to do, on the relatively high

*Note: About 1 January 1963, a new subdivision increased the number to four.

†Two USMAC-V Headway addenda^{1,5} include the following data for 1962:

Incidents and attacks ^a	Theater	Corps		
		I	II	III
1962 average weekly				
Incidents	363	62	108	194
Armed attacks	105	12	16	78
1962 totals				
Incidents	18,899 ^b	3224	5616	10,088
Armed attacks	5,484	624	832	4,056

^aVC losses: total, 30,673; KIA, 20,919; WIA, 4236; CIA, 5518; (defected, 1596).

^bTerrorism, 8809; sabotage, 1981; propaganda, 2625; armed attacks, 5484.

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level of activity (over 50 percent of the total) in the III Corps area, which contains the large portion of the navigable waterways.

TABLE 1
THEATER AND CORPS ZONES DATA, OCTOBER 1962^{1,2,4}

Forces	Theater	Corps ^a		
		I	II	III
RVN forces ("present")	328,000	33,000	53,000	101,000
RVNAF	182,000	15,000	26,000	30,000
CG	65,000	9,000	13,000	32,000
SDC	81,000	9,000	14,000	39,000
VC forces	23,000	4,700	5,100	13,200
RVN/VC ratio	14.2:1	7.2:1	10.4:1	7.6:1
Total VC-generated incidents	1,357	259	327	771
VC, armed attacks ^b	419	71	68	280
VC, other incidents ^c	938	188	259	491

^aActually present and deployed in the Corps tactical zones.

^bDistribution by size and effectiveness not, so far, evaluated.

^cIncludes: terrorism, 583; sabotage, 189; propaganda, 166.

VC personnel losses (claimed): total 2626; KIA, 1967; WIA, 286; CIA, 373; (defectors, 198). VC losses in particular are subject to further analysis; almost every reference to them includes the statement that the VC carried away their dead and wounded. The VC ratio of KIA to WIA (1:0.145), especially is inconsistent with all previous experience factors, where for instance in WWII it was 1.0 to 4.8, and for the RVN in October, 1.0 to 2.1. The RVN ratio is reasonably consistent with the "bullet-type war" going on in Vietnam.

VC weapon losses: total, 446; pistols, 34; rifles, 318; carbines, 44; SMG, 39; BAR, 10; mortars, 1. Losses by each to the other tend to balance out now; the VC has held an edge until recently.

RVN personnel losses (admitted): total, 1214; KIA, 370; WIA, 780; CIA, 64.

Partly approximated from initial data that are usually corrected later.

RVN/VC ratio of personnel losses: about 1.0 to 2.2

Pattern of VC Activities on Waterways

Data were provided on reported VC activities on RVN waterways for the period Jul-mid-Dec 62. In App B is a list of 137 items of available information. A plot, by Universal Transverse Mercator (UTM) grid squares, appears on the attached map.

These data are identified as containing about 80 percent of the reports received by the United States Military Assistance Command, Vietnam (USMAC-V) from RVN (mainly III Corps and RVN Navy) sources. They are further limited to reports of activities involving 20 VC guerrillas and over. Finally, all sightings were not reported; the professional judgment injected indicated that no total estimate could be made at this time.

However, certain conclusions appear justified. It is clear that the waterways are located mainly in the III Corps area from the reported level of

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waterway activity (about 90 percent). This level is, with the incident level (Table 1), evidence of concentration of VC infestation and control. It is also an indication (but not a direct measurement as far as this study is concerned) of RVN activity. Finally, if the III Corps area control is to be taken from the VC, RVN river and canal military activities will have to increase considerably; thus the probability exists that ambushes will also increase and become a greater problem.

RVN Planned Counterinsurgency Operations

Various intelligence and operations summaries list RVN planned operations and usually provide somewhat sketchy results. US advisory personnel produce detailed records, results, and analyses of operations in which they may have been involved in planning and execution, or from debriefings of RVN contingents. Their reporting format is included as App G. The RVN publishes, even in the press, details of many operations. The RVN forces have completed a few after-action report forms generated by the RAC staff members working at the Office of the Secretary of Defense, Advanced Research Projects Agency (OSD/ARPA) R&D Field Unit's Combat Development Test Center, Vietnam (CDTC-V). This report form is currently under revision, and it is hoped that it can be reintroduced into the RVN forces reporting system to good effect.

A limited excursion into the data area included an inspection of some 120 US advisors' after-action reports; some preliminary notes were taken on 40 operations. These occurred in the period September–November, but the number should not be taken as evidence of the total number executed by RVN forces.

Of the 40 operations, 18 were located in the Delta or high-density area of rivers and canals. Fifteen were apparently major helicopter or heliborne operations. In 20 some boats were used, and 8 of these apparently involved boats mainly, and in relatively large numbers. When boats were employed in conjunction with helicopters in particular, and also when ground vehicles and on-foot operations occurred, their missions included patrolling, blocking, and after-action pickup and transport. When boat usage was dominant the additional missions of landing and some fire support were involved.

The current composition of the RVN Navy is given in App F. The larger vessels are employed, or are on standby, for coastal operations including the lower reaches of the Mekong River. The largest principal river and canal boat employed is the Monitor, a US-type landing craft, mechanized (LCM), drawing up to 4 ft 7 in. and armed with one 40- and two 20-mm guns, one .50-cal machinegun, and one 81-mm mortar. The next largest is the landing craft, vehicle, personnel (LCVP), drawing at maximum 4 ft 4 in. It carries one 20-mm gun and three .30-cal machineguns, and 12 troops or 4 mt of cargo. Many other Navy types are listed in App F. Additional Navy types and vessels indigenous to the area range through civilian ferries, sampans, junks, canoes, bamboo boats, swimmer-support boats (SSB), Vedettes, FOMs, and St Cans.

Notes on what may be considered a larger representative operation follow. The event carried the date of 2 Sep 62. The location was the Province of Dinh Tuong, Ben Tranh District (XS353552), about 60 km south by west of Saigon. The action took place mainly on and near a commercial arroyo.

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Twenty-five river craft were employed: 7 RVN Navy—1 LCM Monitor, 4 LCVPs, and 2 FOMs; and 16 CG LCVPs and 2 CG FOMs. These craft transported 1 Ranger company, 2 CG companies, and 2 SDC companies. In addition, 6 Army companies were flown in by helicopter in an encirclement operation. Boat missions listed were transport, block, and pickup. One advisory observation: need better coordination and searchlights at night to bring in troops. This would, of course, make them "sitting ducks." Claims of success included 118 VC killed in action (KIAs).

This type of operation did not generate any items in the River-Boat-Incident Log (see the next section and App C). However, although apparently larger than most, it could have done so (see the section "Composite River and Canal Ambush Scenario, Preface and Postscript").

River-Boat-Incident Log

Incidents, by definition, are those events inspired and perpetrated by the VC guerrillas. They may be independent of, or reactions to, counter guerrilla operations.

The observations in this portion of the discussion are based on the data in App C. These data constitute the complete record in the USMAAG-V Navy Section of river and canal incidents provided by the RVN Navy and are those involving Navy craft only. The period covered is 6 Mar 62-8 Jan 63. The total number of items is 41. Although the source did not provide proof, or an estimate, it was stated that incidents have occurred but were not recorded in their files.

The initial statement of a conclusion, made at the beginning of this paper, regarding the low-level importance of ambushes, depends largely on the size of this list and the results obtained by the guerrillas. For comparison, see Table 1. In one representative month the VC-armed attacks totaled 419; 280 of these, in the III Corps area, were perpetrated in the general area of high density of rivers and canals. In contrast, the total river-boat-incident list of 41 for a period of 10 months is indeed small. It is even smaller for ambushes, if the definition is accepted, i.e., an attack involving considerable and effective guerrilla fires. Of the 41 incidents, only 6 qualified as ambushes, and only 2 caused significant casualties—significant here being 4 or more. The remaining 12 incidents involved mines, of which only 1 caused more than minor damage, and this one involved a sinking by a mine presumably attached to a boat at a pier; 3 were accidents; the remainder appeared to qualify only as sniper and harassing incidents.

In summary, justification for further discussion here, or for the paper at all, rests almost entirely on the potential rather than the actual importance of waterway ambushes in the current conflict. The "potential" argument depends on the dense population distribution in the Mekong River Delta, the many kilometers of river and canals, their importance in the economy and guerrilla military activity, the relatively high percentage of identified guerrilla units and incidents, the percentage of III Corps operations in which waterway craft participate, and the fact that the ambush tactic is basic to guerrilla operations. Understanding of and preparations for countering ambushes would appear to be prudent courses of action in anticipation of an all-out counterinsurgency drive that could generate a significantly high ambush-incident rate.

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RIVER AND CANAL AMBUSHES

The special characteristics of river and canal ambushes, as distinct from ambushes in general, are examined under three headings: weapons and techniques, barricades, and an illustrative, composite scenario.

Weapons and Techniques

Information on weapons and techniques was accumulated from VC sources,⁶ from US field advisors' after-action reports, from USMAC-V and USMAAG-V advisory sections, and from personal observations.

Typical weapons and techniques used by the VC guerrillas in ambushes are:

Small arms (includes automatic hand weapons), .45- and .30-cal homemade rifles, and light weapons of Chinese, US, French, and British origin; employed from river- or canal-bank cover.

Grenades, small, hand-thrown; maximum range, 75 yd.

Machineguns, mainly .30-cal; .50-cal types in relatively small numbers known to be available; employed from river- or canal-bank cover.

Mortars, mainly 81-mm; typical employment.

Recoilless rifles, mainly 57-mm, with shaped-charge ammunition; employed from emplacements on river or canal banks. Currently few in number.

"Launch-bombs," precise caliber uncertain; generally homemade, with some shaped-charge characteristics; launching techniques uncertain in detail; employed from banks of rivers or canals.

"Bazomines," roughly equivalent to a US-type bazooka launcher and round, with shaped-charge effects; fired from fixed mount placed some 10 m from river or canal bank in appropriate cover; optimum aiming point is engine compartment of target boat. Reported aiming technique: daytime, in line with flowerpot float attached to mines; nighttime, floating bottle with fireflies.

Depth charge, usually a homemade mine, believed to weigh from 6 to 100 kg; rests on river or canal bottom with wires to and beyond banks in ground cover for electrical detonation by individual. Wires to bank kept taut and submerged by small stone weights, reported at depth of 40 cm and anchored at bank with "obstacle to prevent bank sweeping" at 1-m depth. Readiness, especially watertight integrity, requires removal and checking every 5 or 6 days. Aiming technique similar to that used for bazomine.

Floating charge, uses rubber inner tube; lines attached to both shores; pulled in path of target craft; detonated electrically.

Attached charge, reportedly with shaped-charge effect of 3 to 6 kg, emplaced by swimmer to docked or anchored craft at engine compartment; fired electrically by trailing wires from river or canal bank.

The VC, characteristically as is the case in most guerrilla-type operations, are relatively poorly supported by supplies of weapons, ammunition, and general logistical items. Considerable dependence is placed on obtaining all types of weapons and ordnance by capture from opposing forces. Food is obtained by growing it in own plots and by seizure from local inhabitants or from opposing force stocks. The whole pattern is one of frugal use, own manufacture, improvisation, and, at times, somewhat startling ingenuity. This pattern extends to tactics and techniques.

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With respect to weapons and techniques of employment, those at present are consistent with requirements. Effective new types or variations may be expected, however, especially if countertechniques become effective, e.g., mine detection or sweeping. The acquisition or development of influence-type mines—contact, acoustic, magnetic, etc.—has been mentioned, especially if the largest RVN Navy craft are used to a greater extent than in the recent past.

Canal barriers, log barricades and dikes, or some combination; heavy, anchored logs with diagonal reinforcements; dikes, being earth works with various degrees of (mainly straw or bamboo) matting; some hastily constructed, which can be pushed aside (but at the risk of fouled propellers and shafts); some requiring considerable labor and blast effects to remove—frequently while being molested by the enemy (see discussion in the next section).

Barricades (App E)

A favorite activity of the VC is to construct barricades on the rivers and canals in the Mekong River Delta country thereby to prevent or impede river-craft military operations, logistical support of RVN post and strategic hamlets, and generally to obstruct commercial traffic. They may be used as part of an ambush action by stopping boats or slowing their progress, thus providing better targets; a partial barricade will canalize traffic, permitting a more effective ambush operation; and mines and booby traps attached to the barricades may be a part of the ambush technique. No detailed listing appears to have been made; thus the total number installed or encountered is not available. However, miscellaneous reports and observations in various intelligence media lead to an impression of quite large numbers, especially in areas dominated by the VC and critical to counter guerrilla operations.

There are three basic types of barricade, the simple log type being the one most frequently encountered. Crossed logs, frequently as small as 3 to 5 dm in diameter, are emplaced in the waterways (25 to 50 m in width) with bamboo and vines interwoven to give the structure strength. In areas where there is a constant current in one direction, debris accumulates in the up-current side. This accumulation is supplemented by the addition of small trees, bushes, and foliage. The usual method of removal is to secure lines to the main structural members and then use river craft as tractors to pull them out.

The next most common barrier is the simple mud dike, used most effectively in canals having a tidal current. Besides restricting the movement of typical military river craft, this barricade reduces the rate of flow of the tidal currents above the dike and facilitates the transit of nonmotorized VC craft. The most effective method of removal is the use of a dredge or clamshell crane. However, explosive charges are normally used. In theory such charges, of sufficient size and properly emplaced, are effective. In practice, lack of elementary knowledge, materiel, and equipment frequently results in abortive removal attempts. Insufficient amounts of explosive placed at shallow depths tend to do more harm than good since they blow off the top of the dike, causing the ultimate removal to be more difficult.

The least often encountered but most difficult to remove is a mud dike with two log barricades, one on each side, 2 to 3 m apart. Removal by dredging is ineffective, as are explosive charges; clamshell cranes, not usually available, can perform a satisfactory job. The practice followed is a lengthy

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operation of pulling out the log barricades, removing accumulated debris, and using explosives to remove the mud dike.

Certain operational problems are encountered. The removal of a barricade as a prelude to a search-and-clear operation gives warning to the VC guerrillas. They disappear or prepare a warm reception. Simple barricades also can be erected overnight. Logically, because barricades require removal to permit the usual traffic, a regular program is indicated, associated with random selections of sites to reduce the intelligence value of removal just prior to an operation. Additional observations include the need to conduct reconnaissance at low tide, since barricades might not otherwise be detected; and waterway operations should include at least one boat equipped with explosives and available gear to effect removal promptly.

Currently barricades are the most frequently encountered and difficult waterway problem. Even the simple ones result in fouling of boat shafts and propellers. Research and engineering studies leading to more effective removal methods are accorded top priority.

Composite River and Canal Ambush Scenario, Preface, and Postscript

Preface. The basic tactical and doctrinal elements have been reviewed at the beginning under the heading "Definition" in the "Introduction." The ambushing unit will vary in size and normally is inferior in men and weapons to the force being attacked. Although ambushes may be hastily planned to take advantage of an unexpected opportunity, usually they are preplanned in accordance with intelligence on enemy patterns of action or movement. The elements of surprise, stealth, camouflage, and maximum use of cover are invariants. All weapons are used in concert and at maximum rate of fire at the outset, frequently in conjunction with the use of devices to destroy or damage vehicles and impede the movement of the ambushed unit. The initiative enjoyed by the ambusher usually permits him the choice of pressing the attack or retiring with minimal losses.

Although these characteristics describe the basic pattern, it is impossible to select one ambush that might be called typical. The size and purpose of the ambush, the topography, and the weapons and associated techniques vary considerably. The scenario that follows, designed to provide a basis for further discussions of measures and countermeasures, is believed to be representative by virtue of including mention of alternative actions, reactions, and weapons.

A River and Canal Ambush Scenario. A counterinsurgency search-and-clear operation* designed to find, flush, harass, capture, and destroy a specifically reported VC guerrilla unit, or a sweep of an area of known guerrilla concentration—a cell of five or a battalion of 150 to 300—is programmed. The required counter guerrilla force is set at one company of ARVN Rangers, supported by one platoon each from the CG and the SDC. Access to the area is best accomplished by an inland waterway employing Navy and CG river craft.†

*Other type operations include rescue or reinforcement missions or barrier removal.

†For some time past, and as this paper is being written, a survey of operations of this type frequently, if not usually, reveals the employment of helicopters as the main transport means, or their use to bring in additional troops to attempt encirclement of the guerrillas. River craft provide some local transportation functions, act as surveillance elements, perform blocking missions, and act as transports during retirement from the area.

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To transport the approximately 120 troops, 10 river craft are provided: 9 LCVPs and 1 Monitor—a specially designed LCM. Each LCVP is armed with three .30-cal machineguns and one 20-mm AA gun; the Monitor carries one 40-mm AA gun, two 20-mm guns, one .50-cal machinegun, and one 81-mm mortar. The troops are armed mainly with small arms, light machineguns, and several mortars.

The general area of the operation is in the southern portion of Vietnam, which has a high density of rivers and canals; it is also an area in which the VC infest and control a large portion of the habitable land and the routes of movement. The troops are off-loaded without need for shore assault techniques at the designated point. The operation is planned to last about 3 days. The search-and-clear operation is not in itself significant in this scenario. The force fans out in accordance with standard procedures. At intervals the river craft reload and redistribute the troops. VC guerrilla contacts may be made; frequently no guerrillas are encountered.

In midafternoon of the third day the troops are taken aboard and the small fleet commences the journey back to home bases. This is a typical time for an ambush to occur. The tendency is for the troops to be less than normally alert, tired, and rather relaxed.

The geometry of the ambush attack is described as follows. Typical canals are 25 to 50 m wide and 2 to 5 m deep. Dense foliage on the banks grows to a depth of 3 to 5 m; rice paddies extend various distances beyond. A good ambush site, from the guerrillas' point of view, includes stands of dense growth beyond the rice paddies, providing additional cover for an escape route.

Ranges of opening fires begin at about 25 m for small arms, some 30 to 50 m for bazomines, and increase to 100 m for larger weapons. A hastily installed barricade made of bamboo, with accumulated debris, or a more permanent one of logs or logs-and-mud dikes could be at or near the ambush site.

The size of the ambush party and their weapons determine the volume and type of onset fires. A mine detonation, adjusted to damage the lead craft, or the Monitor, may signal the opening of action. Variations on initiation include the use of launch bombs, bazomines, and/or recoilless rifles. The detailed techniques for VC employment of various weapons are indicated in the section "Weapons and Techniques" and in App C. The onset fires are at maximum rates and generally for short durations of from 30 sec to a few minutes. Heavier weapons seek vulnerable parts of the craft at or near the engine compartments, and all other fires are directed especially toward personnel manning weapons. Most of the casualties inflicted occur during this initial period.

The reaction of the unit under attack is to spray the ambush area with all available weapons. The intensity of this reaction of course depends on the guerrillas' success in producing casualties and the alertness and aggressiveness of the attacked unit.

Subsequent events depend on the real or imagined force ratio, ambusher to ambushed. The ambushed unit may retire, continuing to attempt to neutralize the fire of the VC as observed and also to fire into the growth areas along the banks from which additional attack is likely. Conversely, under cover of suppressive fire, a counterattack may be launched to close with the guerrillas in an attempt to destroy them. Typically the ambusher will have a well-defined retirement plan, take maximum advantage of cover, and melt away carrying his casualties, if any, with him.

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The ambushed unit will normally attempt to call for assistance. The nearest post, hamlet, or village will be alerted; and the area of attack may become the center of interest for further search-and-clear operations. The arrival time of reinforcements will determine possible usefulness; characteristically the guerrillas will have disappeared.

Postscript. Measures and countermeasures, tactical and technical, are presented under separate headings and will be omitted here.

The important aspect of ambushes may be implicit only in the scenario; they are underlined explicitly as follows. The ambush as a technique is consistent with guerrilla doctrine with respect to economy of force and retirement in the face of superior force.

The scenario deliberately gives the impression that the VC are successful in disengaging and retiring with a minimum of casualties. Factors involved include VC cover advantage, effects and importance of onset fires, relative casualty-producing ineffectiveness of reaction fires, escape tactics, difficulties of launching a counterattack, lack of RVN forces aggressiveness (based on opinions expressed by US advisory personnel), and reaction time of rescue or reinforcement operations. These factors are believed to be supportable from evidence available, but it is recognized that the total number of events on which the data and observations are based is small. Subsequent events may result in some modifications.

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AMBUSH MEASURES AND COUNTERMEASURES

LISTING OF RVN MEASURES AND COUNTERMEASURES

The basis for the identification and evaluation of measures and countermeasures is limited to data on only a few ambush incidents. In the event, as is likely, that ambushes become more frequent, additional study may be warranted.

Some of the measures are peripheral to the study, such as the communications and administrative problems associated with rescue and reinforcement operations; such activities can and probably should be subjects for separate, intensive investigation. Finally, changes must be anticipated. These include VC guerrilla counter-countermeasures, should ambush countermeasures become more effective.

Table 2 has been constructed to provide perspective for assessing possible measures and countermeasures. In such a table it is not possible to provide rigorous identifications, although the text to follow will expand on this matter. For instance, identifying operations research as of possible value in studies of all special categories is believed to be a correct assessment; however, it is clear that it can contribute more or less in each instance. No priorities or relative values should be inferred. The same considerations apply to field tests and materiel R&D.

Somewhat the same problem of judgment applies to the listing of subordinate categories under the general categories. Some might be listed under more than one. To the extent that judgment permits, items closest to the next category are those most likely to qualify for multiple listing or tend to merge with the category that follows.

The listing of an item under a category does not mean necessarily that all subordinate categories have been identified. To the extent consistent with time and available data, the items of primary interest to the river and canal ambushes have been investigated.

DISCUSSION OF RVN MEASURES AND COUNTERMEASURES

Prevention

An investigation of ambushes in itself does not justify conclusions of a broad and sweeping nature. However, even the most elementary understanding

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TABLE 2
RIVER AND CANAL AMBUSH MEASURES AND COUNTERMEASURES

Category ^a	Classification ^b				Investigation ^c		
	Strategic	Tactical	Technical	Operational	Field testing	Material R&D	Operations research
Prevention							
Control-pacification	x ^d	x	x	x	A ^d	A	A
Air(heli-) borne operation	— ^d	x	x	x	A	A	A
Counterintelligence	—	x	x	x	A	A	A
Inhibition							
Deception	—	x	x	x	A	A	A
Defoliation	—	—	x	x	A	A	A
Air cover and escort	—	x	x	x	A	A	A
Barricade removal	—	—	x	—	A	A	A
Antimine operations	—	x	x	—	A	A	A
Ambush-pattern analysis	—	—	—	x	—	—	A
Detection							
Intelligence	—	x	x	x	A	A	A
Airborne photography	—	x	x	—	A	A	A
Visual-aid detection	—	x	x	—	A	A	A
Electronic detection	—	x	x	—	A	A	A
Other sensory detection	—	x	x	—	A	A	A
Search-and-clear, ground	—	x	—	x	A	—	A
Search-and-clear, river force	—	x	—	x	A	—	A
Reconnaissance by fire	—	x	—	—	A	—	A
Survival							
Unit organization	—	x	—	x	A	—	A
Vehicle design	—	x	x	—	A	A	A
Protection (armor)	—	—	x	—	A	A	A
Damage control	—	—	x	—	A	A	A
Suppressive fires	—	x	x	—	A	A	A
Destruction							
Retaliatory fires	—	x	x	—	A	A	A
Frontal attack	—	x	—	—	A	—	A
Encirclement	—	x	x	x	A	A	A
Pursuit	—	x	—	x	—	—	A
Reinforcements	—	x	x	x	A	A	A

^aThe general categories "Prevention," "Inhibition," "Detection," "Survival," and "Destruction" are meant to be in an order going from the general to the specific. The subordinate categories simply constitute the list of measures or countermeasures to be considered.

^bUnder classification, "Strategic," "Tactical," and "Technical" are generally accepted terms; "Operational" is inserted to denote an area of activity between strategy and tactics that should be made more specific. For example, the theater of the RVN is divided into three (now four) Corps Tactical Zones, each with a somewhat different topography, density of population, number of guerrillas, etc. Thus "operational" problems and solutions for each are potentially different even though the general strategy and the basic tactics are identical.

^cThe heading "Investigation" is broken down into "Field Testing," "Material," "R&D," and "Operations Research." They are not mutually exclusive; indeed, in most of the general and subordinate categories they are mutually supporting.

^d— indicates either "not applicable" or "not strongly indicated;" x denotes "applicable;" A indicates the type of investigation that is likely to provide assistance in the solution of an actual or potential problem.

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of counterinsurgency and the Vietnam situation must recognize that the ultimate solution, including that for ambushes, is prevention. And prevention will be the result of regaining positive control of all Vietnam. It is also understood that control can be gained only by a combination of political, economic, and military measures. The foregoing observation, obvious as it may be, is included to place all other subsidiary solutions in perspective. It is important to search for better solutions and apply research techniques to achieve improvements in the various measures and countermeasures. Cumulatively such improvements will advance the effectiveness of combat operations.

It is noted that airborne (or heliborne) operations permit avoidance of waterway ambushes, thus preventing them. Also, any improvement in counter-intelligence is an effective adjunct to the countermeasure requirements.

Inhibition

When ambushes cannot be prevented certain steps may be taken to reduce the probability of an ambush occurring, or reduce its effectiveness by indirect means. Deception is one of these. Many search-and-clear operations follow a rather well-publicized pattern and objective. This is not necessarily poor practice, as part of this war's objective is to instill faith in the government and confidence in the people that the government has the will and power to protect them. However, as in the case of removing barricades as a prelude to an operation (see App E), the VC can plan an ambush with considerable certainty of opportunity.

Defoliation, especially of river and canal bank vegetation, may inhibit ambushes. Extensive work has been done on the technical feasibility and logistical cost. Attempts have been made to ascertain the effects of VC activities from operational data. This is a typical operations research problem. As of this date the results have been ambiguous because adequate data are lacking. Many kilometers of highways have been cleared on each side to remove the cover generally essential to effective ambushes. Costs permitting, and when justified by an analysis of incidence rates, defoliation may well be an important inhibiting factor. At the same time, air cover and escort may affect the incidence of ambushes. This requires evidence, as in the case of defoliation. Operational tests are now being conducted on the value of air cover to protect railroads from ambushes. There is some evidence (as of this date) that it has value. Since such actions tend to have a temporary effect and good flying weather and aircraft availability must be taken into account, the results may be uncertain.

Barricade removal is necessary to permit normal use of waterways for commerce and military operations (see App E and the section "Barricades"). Barricades form a part of the ambush problem, helping to set up boat targets and canalizing group movements. As already noted, their removal is a top priority research and engineering problem.

Antimine operations include consideration of detection, sweeping, dragging, wire cutting, and destruction. Data available lead to the conclusion that no methods tried thus far for any of these have proved successful or practical. One obvious reason is the total length of navigable waterways, some 4600 km. Magnetic detection devices may be useful, although detection and detonation

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(by hand from the river or canal bank) may well coincide. Various sweeping techniques have been attempted, especially to cut the wires leading to the bank from the mine. Launches with booms, necessarily rigged alongside a dock or mother ship, have been tried. The booms have bent or have broken away. A countermeasure would be to bury the wires a little deeper. Dragging is possible and might be effective. The results of such efforts thus far are unknown since if wires have been cut there has been no observable evidence. It does not appear that any direct destruction methods have been devised, at least one reason being that mines must first be detected. If detection were to take place, shallow diving methods would suffice. Some concern for influence mines, mainly magnetic, has been noted. Thus far, since most VC mines are homemade (e.g., the use of 105-mm shells), it may be stretching a point to consider them a significant threat. In any event, mines are a problem, and a proper subject for countermeasure investigation.

Ambush-pattern analysis should continue as a matter of course. Owing to the limited number of incidents, the amount of data available is presently sparse. Pattern analysis is simply a systematic and more objective way of gaining the maximum value from experience.

Detection

The usual answer to the questions on the detection of ambushes is "impossible." The usual answer to the question as to how this situation might be changed is "intelligence." This means having a sufficiently large part of the population responsive and unafraid to alert potential ambush victims to the danger.

Means of detection that are fundamentally technical in character should be pursued "with all deliberate speed." The problem is formidable. The target to detect is usually a small group, camouflaged under the dense natural cover of a tropical country, with a minimum of hardware, and motionless. Techniques to continue to pursue include airborne photography, visual aids, electronic detection, and other types of sensory devices. Operational detection methods include search-and-clear sweeps on the ground and mainly on foot, sweeps along the navigable waterways, and reconnaissance by fire. All require considerable effort, and fire reconnaissance is practicable only when there is a very high probability that the ambusher is in fact in the vicinity.

Survival

As previous discussion makes clear, to be able to survive the initial heavy volume of fire is a primary requirement. Unit organization mentioned here could as readily appear under most other headings. Also, unit operations, instead of organization, would be applicable. The factors include such matters as (convoy) numbers, types of craft, deployments and formation, spacing, formation placement of type vessels and armament, intracommunications as well as communications with other forces, speed, administration, and tactical leadership. These are matters for professional consideration and, subject to data availability, analysis comparable to that applied classically to ocean traffic and convoys in WWII.

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The special categories vehicle design, protection (armor), and damage control are closely related and also might be listed elsewhere, especially under the next general heading, "Destruction." Craft now employed include those indigenous to the country and area—all types of shallow-draft small wooden and bamboo boats, sampans and junks, and barges and tugs (see App A); and landing craft provided by the US—personnel and mechanized (see App F). There are also craft left by the French such as St Cans and Vedettes. These vessels appear to be generally suitable and adequate for the job to be done. For instance, consideration might be given to boats of new materials, exotic designs (as a swamp buggy), and new propulsion techniques (such as jet). However, there do not seem to be compelling reasons for bringing in such craft. Designs based on indigenous craft such as sampans and junks, capable of being locally produced, appear to offer the best promise, and at least cost. Armor protection, limited to weight, thicknesses, and hardness to fend off small-arms fire may be useful in specific cases. However, it is believed that most craft available and projected are already overloaded. Damage control is of primary concern to the larger craft (US types). This problem and all those in this paragraph can best be analyzed if and when more operational data are available.

Suppressive fires, as in the case of highway ambushes, appear to offer a significant contribution to ambush survival as well as to the defeat of the ambush parties (see the next section). Throughout this study, implicitly and explicitly, it has been noted that ambushes are almost always begun with a large volume of fire, with a resultant demoralizing shock effect. Survival (and retaliation) depends heavily on returning the fire in kind. To accomplish this it is generally agreed that a semiautomatic system is required. Detailed studies have been made, including those in connection with comparable highway ambush problems. In addition to maximum use of small arms and light machineguns (and, when available, larger calibers such as those carried by Monitors, including mortars), flamethrowers, multiple-grenade launchers with effective patterns of placement, use of chemicals such as CS, and smoke have been proposed. Claymore mines offer possibilities if the back blasts can be accommodated. Classified ammunition, with both point-detonating and delayed-action fuzes, is an obvious candidate for testing in the ambush environment. It is understood that an unclassified version with larger fragments is available and might be more suitable against personnel under heavy cover. A research and test program is recommended.

Destruction

It must be assumed that the frequency with which the VC guerrillas employ ambushes, and their effectiveness, depend in part on an ability to escape in the face of generally superior forces. The problem of destroying ambushing units appears to be mainly a tactical problem, assuming survival and the appropriate amount of aggressiveness on the part of the victims. Retaliatory fire is, of course, merely an extension of suppressive fire, with the same weapons being generally applicable. Aggressive frontal attack, as well as encirclement and pursuit, are parts of the tactical pattern. Encirclement requires special mention, tactically and technically.

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The VC guerrillas' capability for retirement depends on having an unrestricted escape route. The time element is on their side. One constraining factor could be encirclement by fire. To attain this end, active, relatively long-range fire employing grenade launchers, mortars, and both point-detonating and delayed-action ammunition is indicated. Further, a concept of air-laid mining appears to be worth investigation. A temporary fire curtain of the order of 150- to 300-m range would inhibit, perhaps even prevent, guerrilla escape in many cases. Air-laid mines should be self-sterilizing, with the length of active time being determined from additional tactical data and operational testing.

The final special category item listed is reinforcements. Typically, the nearest hamlet, village, or military post is contacted in case of ambush occurrence. A major problem is elapsed time for arrival. Additional problems include communications (automatic, semiautomatic, and deliberate), transport, administration cognizance, and tactics. Communication solutions are being actively pursued in the technical and test organizations already present in the theater.

VC COUNTER-COUNTERMEASURES

Any change in VC emphasis on ambushes, or reactions to increase in success by RVN forces against ambushes, may generate problems associated with counter-countermeasures.

Speculatively, mines, except for those actually attached to river craft, have been relatively ineffective. The VC might well afford the increased logistical problem of increasing their size and sophistication.

There appears to be a high probability that heavier weapons, especially recoilless rifles, may be employed more frequently in the future. They combine accuracy and effectiveness.

Current ambushes appear to take place in lightly populated areas, thus they may be more generally anticipated away from hamlets and villages. A shift to more heavily populated points might take place.

If semiautomatic, heavy, suppressive fires should become available and effective and be a "one-shot" capability, it would be natural for the VC to "trigger" them with a false attack, then press home the real ambush.

RECAPITULATION

A recapitulation of this study, including the "Conclusions" and the "Recommendations" is provided by the "Summary."

Appendix A

SELECTED RVN STATISTICS ON POPULATION DISTRIBUTION, HIGHWAYS, RAILROADS, AND WATERWAYS²

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The purpose of this appendix is to present in brief form and in perspective the relative availability of trafficable ground routes of commerce and military logistical support, i.e., highways, railroads, and waterways. Supplemental data are included on population distributions, costs of building and upkeep of highways, ground and waterborne vehicles in use, upkeep of seaborne capabilities and inland waterways, and railroad use rates.

These data provide, in conjunction with intelligence data on VC waterborne activities (App B) and the distribution of VC-inspired incidents (App C), a pattern of their relation.

TABLE A1
POPULATION DISTRIBUTION, RVN, 1 JUL 60^a

Location	Population	Population density, per km ²
South Vietnam ^{b,c}	9,110,800	134
Lowland, Central Vietnam	4,357,500	78
Highland, Central Vietnam	603,700	12
Total for 171,665 km ² area	14,072,000	82 (total area)

^aPopulation in chief towns, 2,377,710. Population in rural areas, 11,694,290.

^bSouth Vietnam is largely the Mekong River Delta region.

^cPopulation, Saigon, 1,400,000.

An incidental value is the indication of available types of data of possible interest to other studies of counterinsurgency in the RVN.

The area designated in the Statistical Yearbook² as "South Vietnam," consisting in large part of the Mekong River Delta, an area of the principal rivers and canals, accommodates about 64 percent of the RVN population; the central lowlands, also containing waterways, support about 31 percent. Thus about 95 percent of the population is river and canal (and coastal region) oriented. The local concentrations of population, especially the so-called "South Vietnam region" attests to the attraction of waterways. Not in the statistics, but from overflight observation it is noted that the rural population groupments—some 84 percent—tend to locate strung out along the waterway banks. Table A1 contains population data.

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NAVIGABLE WATERWAYS

It is presumed to be unnecessary to dwell on the importance of water and waterways in either developed or undeveloped countries. However, brief emphasis is indicated on their value in underdeveloped countries and in Vietnam in particular. The population distribution in Vietnam attests to their value for subsistence, agricultural irrigation, and avenues of movement.

Data on navigable waterways for 1959 are given in Table A2.

No detailed data are immediately available on the density of waterways by region. From general observation, however, percentage population densities and percentage lengths of navigable waterways in Vietnam are largely identical. Noted here, but of greater specific interest later, the regions of both highest densities of population and navigable waterways are those in which the VC guerrillas hold greatest control and present the thorniest problems for elimination or pacification.

TABLE A2
NAVIGABLE WATERWAYS, RVN, 1959^a

Type ^b	Length, km	Total
Great rivers	1252	2393
Rivers, <u>rachs</u> , and arroyos	1141	
Canals		
Main waterway	1576	1576
Secondary waterway	478	682
Tertiary waterway	159	
Total		4601

^aOnly insignificant changes for 1961.

^bAs defined in source.

TABLE A3
HIGHWAYS, RVN, 31 DEC 59; 1961

Location	Surface							
	Asphalt, km		Crushed stone, km		Earth, ^a km		Total, km	
	1959	1961	1959	1961	1959	1961	1959	1961
South Vietnam	2258	2248	4191	4108	2816	3915	9,265	10,266
Central Vietnam								
Lowlands	671	805	325	481	1281	2118	2,277	3,404
Highlands	1409	1574	861	873	2202	2845	4,472	5,292
Total, km	4338	4627	5377	5457	6299	8878	16,014	18,962

^aRoad usable more than 6 months of the year; unpaved.

A gross assessment of the importance of waterways as routes of movement is obtained from comparing data in Table A2 on navigable waterways and Table A3 on highways. Waterways, in length, represent about one-half that of all roads and about 70 percent of asphalted plus crushed-stone-surfaced roads.

SECRET

HIGHWAYS

Data on highways appear in Table A3.

The number of motor vehicles in use in the RVN and the number of non-mechanical vehicles "having paid the tax" in 1958, 1959, and 1961 appear in Table A4.

TABLE A4
MOTOR VEHICLES "IN USE" AND NONMECHANICAL VEHICLES
"HAVING PAID THE TAX"—1958, 1959, 1961

Vehicle	Year		
	1958	1959	1961
Mechanical			
Passenger cars	35,313	36,058	27,433
Heavy vehicles	15,097	16,823	22,917 ^a
Motorcycles and cyclomotors	34,138	37,835	43,322
Nonmechanical			
Horse-drawn carriages	4,174	4,151	3,490
Carrier tricycle	12,449	11,863	12,162
Push-cycle	12,044	13,092	13,195
Bicycle with trailer	4,566	4,756	5,888
Bullock cart	10,611	11,708	11,764
Buffalo cart	977	1,349	5,316 ^b
Hand cart	1,570	1,417	1,586

^aA 36 percent increase in heavy vehicles.

^bThe increase in 1961 appears to be a part of the effort to improve the mobility of the agricultural community.

This compilation is of value as a gross picture of the traffic pattern.* Only minor changes, 1958 to 1961, appear to have occurred except as indicated in the footnotes below.

*The differences between the official vehicle data and the data in the press have not been resolved. The press data[†] are given below as a matter of incidental interest:

155,000 MOTOR VEHICLES IN SAIGON

SAIGON Jan. 9 (VP) — Three hundred buses and 155,438 three and four-wheel motorized vehicles are now operating on the capital's 300 kilometres of streets, recent statistics show.

This figure includes 51,637 private automobiles, 13,628 cars used by Government services, and 2,593 vehicles belonging to the Diplomatic Corps. Taxis number 3,409; trucks, cars for hire, cycles, school buses, etc., make up the rest.

Besides the above, over 400,000 scooters, bicycles, and motor-bikes contribute to Saigon's rush hour traffic jams. During the first nine months of 1962 there were about 10,000 traffic accidents, 6,000 of which caused only material damage. Only 40 fatalities occurred in the 3,000 accidents involving slight or serious injury. Traffic police gave out an average of 800 tickets a day for traffic violations, the statistics said.

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It is possible only to obtain a general notion of the number of craft employed in overseas, coastal, and river and canal activities. For example, a footnote to the statistical compilation reads: "NOTA—These figures must be reduced by 50% for destruction due to the war circumstances."² What is clear is that given the availability of the coastal sea lanes and the waterways, and the relative paucity of roads and railroads, waterborne movement is a major activity in the RVN. Also, in particular for coastal traffic, the dangers associated with the war are minor, at least for the period through 1962. Table A5 contains data from the Yearbook.³

TABLE A5
JUNKS, BARGES, MISCELLANEOUS CRAFT, AND SEA CRAFT,
REGISTERED AS OF 31 DEC 61^a

Draft, tons	Sailing vessels	Steamboats	Miscellaneous, self-propelling	Wood junks	Metallic barges, nonpropelling
Up to 50, no. of craft	46,718	2690	3800	—	—
Average, tons	1.66	3.8	1.25	—	—
16-50, no. of craft	—	—	—	3533	44
Average, tons	—	—	—	26	28
50-100, no. of craft	18	15	—	—	—
Average, tons	75	53	—	—	—
51-150, no. of craft	—	—	—	506	111
Average, tons	—	—	—	88	100
100-300, no. of craft	2	2	—	—	—
Average, tons	105	127	—	—	—
151-250, no. of craft	—	—	—	603	132
Average, tons	—	—	—	205	190

^aTotal: 58,249.

One additional look at the relative importance and economic drain of routes of commerce is reflected in the funds allocated to roads, seaborne shipping, and internal navigation in 1958, 1959, and 1961 (Table A6).

RAILROADS

Table A7 provides data on the RVN railroad system, as of 1959 and 1961.

The railroad service supplies mainly the eastern coastal area, including the four major seaports of Saigon, Nha Trang, Qui Nhon, and Da Nang. They are not vital, internally, to the South Vietnam region as are the waterways and roads.

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TABLE A6
TOTAL NATIONAL, PROVINCIAL, MUNICIPAL, AND COMMERCIAL
BUDGETS, PLUS EXTRAORDINARY BUDGETS FOR ROADS,
SEABORNE SHIPPING, AND INTERNAL NAVIGATION

Location	Amount, VN dollars ^a		
	1958	1959	1961
Roads ^b			
South Vietnam			
New works	99,001,000	124,322,000	97,169,000
Upkeep	96,012,000	75,163,000	46,425,000
Central Vietnam			
Lowlands	189,700,000	39,154,000	164,070,000
Highlands	50,595,000	104,970,000	113,867,000
Seaborne shipping			
South Vietnam	0	500,000	3,400,000
Central Vietnam			
Lowlands	2,132,000	48,000	1,199,000
Highlands	0	749,000	0
Internal navigation			
South Vietnam	3,005,000	0 ^c	0 ^c
Central Vietnam			
Lowlands	0	0	0
Highlands	0	0	0

^aThe government official rate is 35 \$VN to \$1.00 US; the official rate for tourists and US personnel is 73 \$VN (approximately) to \$1.00 US; the current quoted international rate is 89 \$VN to \$1.00 US.

^bRoads are costly, as can be seen; internal navigation, currently nil.

^cAll regions, especially South Vietnam, under intensive attack or under control of VC. It is reported, officially, that lack of maintenance of river channels and canals is rapidly causing deterioration owing to normal silting. At least 10 dredging units have been requested from the US by RVN officials.

TABLE A7
RAILWAYS AND RAIL TRANSPORT, RVN, 1959 AND 1961

Year	Exploited average length, km	Personnel employed	Passengers carried	Merchandise transported, mt
1959	1364	5853	2,657,000	399,000
1961	1391	6206	2,580,000	411,500

Appendix B

PATTERN OF VC ACTIVITIES ON AND IN VICINITY OF WATERWAYS—J2,
USMAC-V, PERSONAL INTELLIGENCE FILE⁸

FIGURE

B1. MAP OF RVN THREE CORPS TACTICAL ZONES SHOWING VC WATERWAY
ACTIVITIES AND RIVER-BOAT INCIDENTS

33

TABLE

B1. DATA COMPILED FROM J2 RECORD CARDS

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The following list of "VC Water Locations and Movements," intelligence reports on VC activities, was provided by Cdr J. L. Thornton, USN, J2, USMAC-V. By his estimate, some 80 percent of all reported data are included. It does not purport, however, to include all VC activity. One observable limit is that all reports appear to concern 20 or more VC personnel.

Information received from US sources states that the RVN intelligence effort and organization were poor to nonexistent prior to July 1962. Subsequently there has been continuous improvement. The data are presented, with some minor editorial changes, for the following reasons: as an indication of the kind and amount of data currently available, as evidence of the part that waterways play in VC activities, and as further substantiation of the regional nature of such activities.

The principal source is the III Corps daily intelligence summaries; a lesser number were credited to the RVN Navy.

In the 137 intelligence reports cited the frequency of positions mentioned by UTM coordinate squares was approximately as follows: WS47, XS43, WR21, VS10, XR10, WT9, VR7, WQ5, YS3, VQ3, XT3, AT3, BS3, XG2, AN1, BR1, and CQ1. To the extent that location frequency is an indication of activity on rivers and canals in UTM areas, these data are shown on the map, Fig. B1.

The greatest concentrations are in the Mekong River Delta and in the river and canal region south, southwest, and west of Saigon. The two highest densities occurred 50 and 150 km from Saigon, measuring to the centers of the blocks XS and WS.

The frequency of reports (Table B1) by month is a further relative indication of activity: July, 5; August, 28; September, 28 (not counting the multiple listings in a total of 42); October, 24 (with a bookkeeping lapse indicated); November, 19; and December, 19. July was low on two counts; the bookkeeping was not complete, and toward the end of the month the Vietnam intelligence reporting system was activated at a higher level of efficiency and completeness. Subsequently the level of VC activity appears to have been essentially stable at from 19 to 28 reports per month. Note again, however, that the numbers reported fluctuated not only owing to the actual rate, but indeterminately, owing to reporting procedures.

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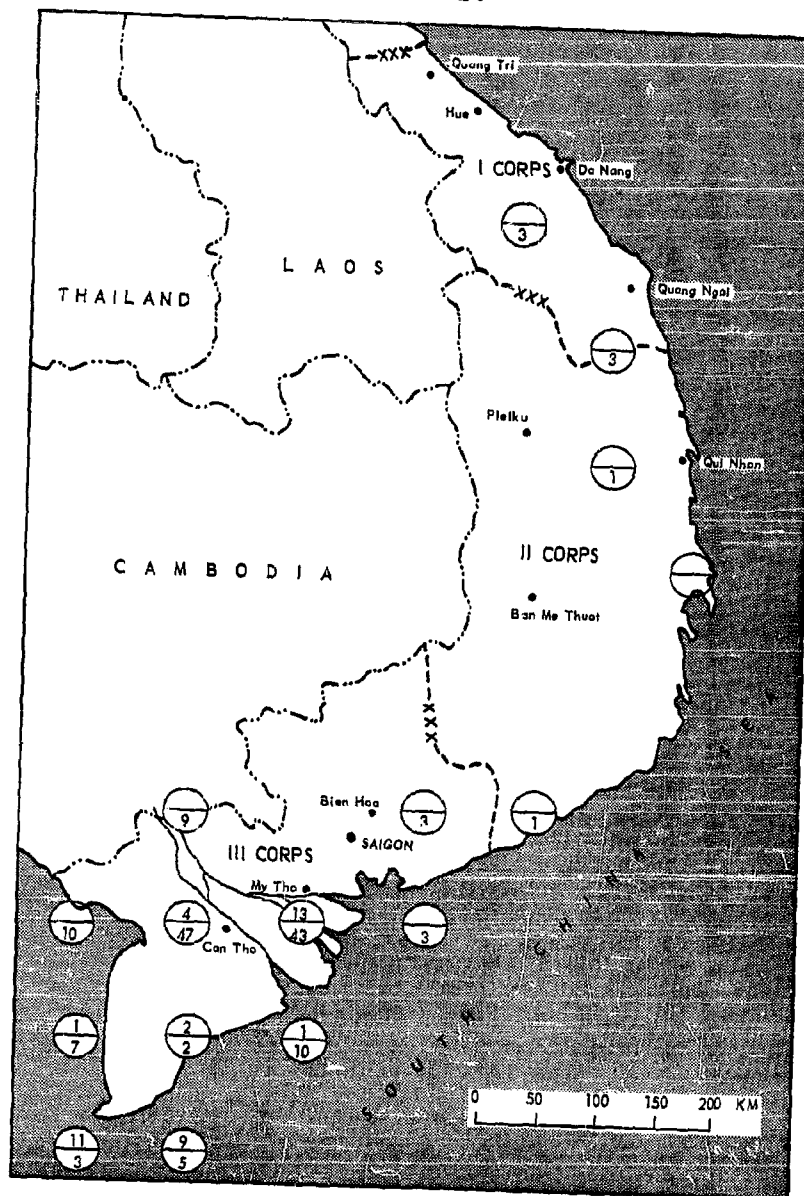


Fig. B1—Map of RVN Three Corps Tactical Zones Showing Location of VC Waterway Activities and River-Boat Incidents
Upper number, river-boat incidents; lower number, VC activities

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TABLE B1

DATA COMPILED FROM J2 RECORD CARDS

Item	Date	Coordinates	Abstract of intelligence report
July 1962			
1	4	XS370520	My Tho River; 2 LCVPs hit mine; little damage; no casualties
2	15	WS2395	Tan Chan; 2 St Cans support SDC under attack; 150 rds; no one seen; VC retreated
3	15	CQ305290	Phu Yen; 10 VC in junks, seized junks and kidnapped civilians; no action
4	28	WR544596	VC prevented boats from using canal
5	30	XS390715	VC retreated to Bac Dong canal
August 1962			
6	5	WT150080	An Giang; estimated 60 VC of 502 Bn used 25 boats to cross into Cambodia
7	7	WS260370	VC watch post
8	7	XS040510	Canal 28, VC refuge area
9	7	XS030520	Bong Rong canal, VC refuge area
10	7	XS180590	Canal 10, VC refuge area
11	7	WS935513	"First" canal, VC refuge area
12	7	WS985515	Canal 5, VC refuge area
13	7	WS880410	Canal 1, VC refuge area
14	8	XS362590	4 VC threw 3 grenades at LCM; 2 casualties
15	15	WS790850	VC concentrated to repair damaged boats
16	15	WS853458	VC co borrowed 30 boats from people
17	17	WQ003799	Bay Hap River, to Ca Mau; Bo Dap; 1 LCM Monitor, 5 LCMs, 2 LCVPs carrying troops; ambushed; friendly; 18 WIA; enemy unknown
18	20	WS902525; WS995595; XS035628	Kien Phong; intelligence rept; large VC boat docked; 2 VC platoons guarding; 70 VC stationed; intention unknown; no action
19	20	XS545800	100 VC established armory
20	21	NA	Tranh De; RVN Navy on patrol; met 1 junk, 8 tons with materiel; fire exchanged; VC boat fled into Long Doc canal; no reported casualties
21	22	WR540520	Many VC from SW stationed at Sakeo canal
22	23	WT585036/ 604030	300 VC of 502 Bn have 3 motorboats and gasoline
23	25	WS960770/ 955753	70 VC, Ky Huong canal
24	25	AT929150 AT945120	Quang Tin; enemy built 60 6-man boats, bamboo; for transport of men and supplies; no action reported
25	26	XS650870 to 625895	200 VC stationed along Kang canal, central point at XS656849
26	27	WT670010/ 815005 WS812900/ 823905	200 VC moved by boat and foot
27	27	WT670100/ WS812980	200 VC carried by boat
28	28	XS940240 (1) XS807252 (2) XS883268 (3)	100 VC moved by sampan from (1) to (2) and are at (3)

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TABLE B1 (continued)

Item	Date	Coordinates	Abstract of intelligence report
29	28	CN030950	15 VC sailing boats, to CP064025; 3 VC "finance" boats operating along Vam Co Song River, Tay Ninh
30	30	WS880880	50 VC moving to "Resistance Canal" (WS880880) from WS930971
31	30	WS570260	250 VC in 150 boats moved to positions at WS570760, WS615740, WS545705, and WS590690
32	30	WR919524	VC have recently established an armory at Thanh Phu Island
33	31	WR500712/ 497695/ 902115/ 902145	800 VC, Chuong Thien
September 1962			
34	2	XS627884	50 VC moved along canal
35	2	WQ360880	An Xuyen; air intelligence; 30-man inboard sampan, empty; changed flags, GVN/VC; reported
36	4	VR908115/ 950105	Camouflaged sampans
37	4	XS668800/ 630880	2 VC co in concealed positions along Ngang canal
38	4	VS748375/ 750437	VC reported Dao San canal to Beo canal
39	4	VS810371/ 912513	VC reported Tam Ngan canal
40	4	VS990355	VC reported Tri Ton canal
41	4	WS030260	VC reported Hang Ngan canal
42	4	WS070295	VC reported Hang Xuci canal
43	4	WS125140	VC reported Ta Keo canal
44	4	WS180244	VC reported Huonh Troung canal
45	4	WS065116/ 074100	VC reported Hon Dat canal
46	4	VS980170	VC reported Vam Rang canal
47	4	WS400031/ 441097	VC reported Cai Be canal
48	4	WS450020/ 490050	VC reported Thi Doi canal
49	4	WS506030	VC reported Nam Ty canal
50	4	WS453080/ 480056	VC reported Chua canal
51	4	WS370071/ 440096	VC reported Xa Trac canal to Cai Be canal
52	4	VS490520	VC reported Vam Hang canal
53	4	WS790995 to 700910	60 VC with 20 boats
54	5	WS730971	60 VC in 20 boats using Phuog Xuyen canal
55	7	WR732721/ 807712	Unknown number VC debarked from 40 canoes
56	8	WS923439/ 928457	100 VC move along Tong Duc Loc, Ba Phu canals
57	9	WS780805	90 VC in 30 boats collect taxes and obtain information
58	10	XS656915	1 VC plat along Vang canal

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TABLE B1 (continued)

Item	Date	Coordinates	Abstract of intelligence report
59	15	YS093595	LCU 536 seized 2 motor boats and 2 fishing boats with medical equipment, office supplies, and machine-shop equipment; 14 PWs
60	15	AT808321	VC attempted to steal boats
61	15	WS880880/ WT690125	200 VC of 2 groups; 1 group to "Resistance Canal," 1 group to Trang River area; this group had many Europeans
62	15	WS880880	Kien Tuong; VC reported employing mines vs GVN shipping; pulled in path on floats; also VC swimmers attack anchored boats; no action reported
63	16	VS960170	VC co moved from Taloc and Van Ranh canal to Hon Dat, VS890155
64	17	XS234639	RVN Navy captured junk with mine-manufacturing unit
65	18	XS956450	2 VC region plat of C-206 in position junction Xom canal and Bong stream
66	18	VR980650 to WR005640	VC constructing training site along Ba Huoi canal
67	20	NA	60 VC in boats on Phuoc Xuigen canal
68	20	WS560750/ 620750/ 560130	Estimated 300 VC in 150 boats
69	20	WS838920	Estimated 60 VC in 25 boats
70	22	XS945625	Bien Hor; 1 VC boat captured; GVN Marine Intelligence Co; related to VC manufacture of ammunition; no further action reported
71	23	VR930520 to VR958520	Estimated 120 VC called U Minh Bn in position at the Lung Stream canal
72	25	WT690128/ 680010	Estimated 30 VC moved by sampans
73	25	YT055440/ 090467/ 120565	VC supply seats from Ba River (Ben 'Tau) to Bao Buoc, Dong Tinh; captured document
74	25	WR498722	VC co bivouac at Ca Muoi
75	27	VR855666/ 860657	Estimated 60 VC moved from Ong Lan canal to Ba Cang
76	27	VQ982860/ 882859	2 sampans with 60 VC moved south along canal
			October 1962
77	1	XS705390	200 VC moved from Loi Quan Island through canal to Van Glong canal
78	1	WS186525	VC watch post at mouth of King Cu canal
79	2	XS395920	Estimated 200 VC passed Tra Cu canal
80	2	XS880308	Kien Hoa; large metal VC boat located; territory between Kien Hoa and Dinh Tuong; no action reported
81	3	WR192763 200765 147746	Obstacles on Zuo Can, Zuo Koo, and Seo Duoc canals
82	4	YS089568	3 VC sampans, with rice, etc.
83	6	XR653930	300 VC bivouacked on Lonh Hoa Island

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TABLE B1 (continued)

Item	Date	Coordinates	Abstract of intelligence report
84	7	XR335632 342646	120 VC observed on Cu Lao Island making spike boards
85	8	WS265130	15 VC searched sampans
86	9	WS510760	100 VC boats located here
87	9	NA	Phuoc Tuy; 2 VC boats stop civilians going for ID cards; GVN boats escaped
88	11	YS426525	Nguyen Minh Duong; PW report; boat ferry; capacity 30-50 men; on 8-day cycle; northern dialect; no further action reported
89	11	XG005690/ 000647	200 VC moved by boat to concealed position
90	11	XT335123/ 384005	100 VC moved by sampan, from — to
91	13	XS260440/ 278440	VC co located along Tra Tan
92	14	AN775955	3/43 captured 3 fishing boats and 20 suspects
93	14	WS805980/ WT790020	100 VC moved in sampans to Ca Mon canal and Co Bung
94	16	XR820950/ 907130	100 VC and 5 nurses
95	16	XS820050/ 907130	100 VC in 2 boats being pulled by motor junk
96	17	XR390550/ 400570	4 VC boats stranded by low tide
97	17	WS092172	40 VC to Vic Kien Lam canal
98	18	WR950698	50 VC unloading sampans
(Break in Recorded Data Made Available)			
99	29	VS600540/ 839416	130 VC in movement
100	31	VS512435	40 VC moved in 15 sampans to Ngang canal November 1962
101	1	XS100641/ 120598 125598	100 VC on Phu Huigon
102	6	WS995670/ XS090645	50 VC arrived in 20 sampans
103	7	WR623617 to WR616606	VC with 50 sampans, from — to
104	8	XS610890	70 VC arrived on Tam Tau canal
105	8	WR636845	VC plat in Muoi Ba Ngan canal area
106	8	WQ270645	An Xuyen, mouth Bo De River; strange boats in South China Sea; unload cargo to small motor boats; no action reported
107	10	XT376145	VC co located in Giong Gang
108	10	WS674061/ 854060	VC dug canal from Dong Giang to Muon Khai
109	11	WS710915	VC bn along Phuoc Xuyen canal
110	11	XS488223 to 534176	200 VC moved, from — to

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TABLE B1 (continued)

Item	Date	Coordinates	Abstract of intelligence report
111	24	XS033578	150 VC in 70 boats to Binh Lang canal
112	24	WS960976	Boats along Vam Co Tay River pay taxes to VC
113	27	XS844823	VC plat moved from Cay Kho canal to Xom Cui stream
		to	
		VS835835	
114	28	WR006048	2 VC co located at mouth Ong Tu river
115	29	WR408730	2 VC units in positions at canal 5 in Co Sau Yen forest
116	29	WR548615	300 VC in bivouac at source of Dao Phay stream
117	29	WS270843	80 VC moved by boat from Hoa Loc to position in area of
			Than Hong canal
118	30	VQ805795	Number of VC come to Rach Cai Doi canal
119	30	BS523470/ 616445	VC use 3 boats to ferry across river
			December 1962
120	1	WR125137/ 126143	34 VC located at Cai Bat River
121	1	XQ793655	Bai Dam Trau; VC large boat drifted ashore and captured; no further action reported
122	3	XS443756	VC boat check point
123	4	XR805883	Kien Hoa; VC seized junk; 21st River Group searching
124	5	WR810980 (1) XR033908 (2) XR041872 (3)	77th VC Bn normally uses Phu Huo (1), Cai Tram (2), and Dy Trinh (3)
125	5	WQ115865	An Xuyen; LCM 1059 attacked by grenade launcher; no action reported; no damage
126	5	WQ030520 VR964889	An Xuyen; CV junk force reported; in 2 divs; "bomb launcher" concealed; detailed report only
127	6	NA	Phuoc Tuy; VC sail junk captured; 3 VC on board; in commerce; intelligence report
128	6	XS388477	Dinh Tuong, 1 LCM, 2 LCVPs attacked; 5 VC with small arms; range 40 m; fire drove off; no casualties; VC escaped
129	6	WS840870 to	70 VC in 30 boats to Go Con area
		WT620010	
130	7	YT338375	Bien Hoa; VC 10-man fishing cell; must sell to VC, balance thrown away
131	8	XS980270 XS970517	Dinh Tuong Province; VC sea movement, fishing; VC posts listed with radios
132	14	NA	Dinh Tuong Province; report: VC weaving straw at base of log barricades; rises and fouls shafting and propellers; must stop and clear; intelligence report
133	14	XS318401 332374	Long An; VC with 15 sampans from island
134	15	XS175670/ 430940	Long Khanh; estimated 100 small boats from Tuyen Nhon, 300 other from Duc Hoa along Tra Cu Thuong to Tuyen Nhon
135	19	XS392918	2 VC co moving SW along Tra Cu canal
136	19	NA	An Xuyen; in areas of Camau and An Xuyen, VC set up new defenses at river mouth; strictly control traffic of fishing boats, woodcutting boats, and canal movement
137	20	BS4467	VC using boats to relocate supply point
138	27	BR970830	Binh Dinh; suspected VC "junk force," in lagoon, Dam Tra O; 50 junks and sampans; identity not confirmed

Appendix C

RIVER-BOAT-INCIDENT LOG, 6 MAR 62-8 JAN 63⁹

TABLE

C1. RIVER-BOAT-INCIDENT LOG

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CONFIDENTIAL

Table C1 is the authoritative log of incidents available at the source.⁹ It was explained that these do not constitute all the incidents that have occurred but all that have been transmitted to them by the RVN Navy. It may be assumed that the list includes the most important events of this type. Record keeping and reporting (by the RVN Navy) are uncertain and at times intermittent. For example, the relatively large number of 12 (out of a total of 41 for the whole period) listed for December 1962 probably reflects in part on-the-spot activity by the USMAAG-V advisor. In any event, this is the most complete listing discovered.

Of the total 41 incidents, 12 appear to be mine types, without associated other-weapons fires; and there were accidents. Six are called "ambushes"; and of these, by casualty criteria, only two were effective. Three launch-bomb attacks and one recoilless-rifle-suspected attack were effective. The remainder, again in terms of reported casualties, may be classified as sniper or harassing incidents.

Therefore, by the somewhat arbitrary definition of an ambush (an event involving considerable and effective fire effort by the VC guerrillas), adding together the three launch-bomb attacks, the one recoilless-rifle-suspected incident, and the two ambushes involving four or more wounded, a total of 6 incidents out of 41, or about 15 percent of those reported, may be said to qualify as ambushes for this study.

These data are the principal basis for the view that river and canal ambushes do not now constitute a significant problem.

The distribution of river-boat incidents is shown on the map, Fig. B1, along with reported VC guerrilla activities. Almost one-third of the incidents were listed in an area centered about 70 km southwest of Saigon, one of the same areas in which VC were reported frequently. Almost half the incidents were at or near the tip of the peninsula. It is concluded that opportunity presented by identifiable RVN waterway convoy usage is a principal determinant of frequency in an area where the VC exercise significant control. It is a reasonable assumption that, if and when RVN waterway activity increases, the incidents, including effective ambushes, will also increase.

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TABLE C1
RIVER-BOAT-INCIDENT LOG

Incident	Date	Location	Method	Damage and identity
March 1962				
1	6	Mekong, 10 km west My Tho	Swamped	Sunk: 1 LCVP, 23 River Group (raised 17 Mar)
2	11	XS093748	Mined	No damage: 2 LCVPs
3	13	Vinh Long	Sunk at pier	Sunk: 1 LCVP
April 1962				
4	14	VQ990685	Mined	Slight damage: 1 St Can
5	15	Vicinity VQ990685	Grenade	
6	16	Vicinity Nam Can	HE shell	
7	17	WQ070800	Mined	Slight damage: LCM CDR 1041
8	30	Vicinity Cau Mau	Mined	No damage: LCM 1060
June 1962				
9	12	WS80802	Mined	No casualties: LCM 1065
10	19	Saigon	Sunk, suspected leak	Sunk: LCM 1005
July 1962				
11	4	XS870520	Hit mine	Slight damage: LCM 2108 and LCM 2104
12	8	WQ084774	Attack, grenade	1 officer slightly wounded on LCM 1037
August 1962				
13	4	Vicinity My Tho	Attack, grenade	No damage: LCMs, LCVPs
14	8	XS362590	Attack, grenade	2 slightly wounded, LCM 1037
15	10	XS554593	Mine, electrical	No damage: LCVP 2166
16	17	Vicinity Bo Dap	Ambush	18 ARVN wounded on 1 LCM Monitor, 5 LCMs, 2 LCVPs
17	27	VR886005	Launch bomb	1 killed, 8 wounded: HQ 1073
October 1962				
18	2	XR065505	Ambush	No damage: 4 wounded on 1 LCM, 4 LCVP, 4 St Cans
19	12	WS925727	Mined	1 battery, 1 helmet, 1 12.7-mm gun cover lost, 2 St Cans, 21st River Group
20	21	WR230744	Launch bomb	No damage: LCM 1078
21	26	Vicinity Camau	Sniper rifle	No damage: 1 killed on LCVP 2128
November 1962				
22	15	XT680220	57-mm recoilless rifle suspected	3 wounded, 4 killed on LCM 1030, 2 LCVPs, 24th River Group
23	19	VQ980608	Ambush of charcoal convoy	1 St Can slightly damaged (12.7-mm gun)
24	22	XS110345	Ambush, BAR	No damage: St Can 5020, St Can 5021

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TABLE C1 (continued)

Incident	Date	Location	Method	Damage and identity
December 1962				
25	4	WQ064792	Attack, grenade launcher	LCM 1059, midshipman wounded in rump
26	5	WQ108842	Ambush, grenade	Slight damage: LCM 1098
27	5	WQ115865	Ambush, grenade	Slight damage: LCM 1059
28	5	WQ110845	3 mines	No damage: 4 LCMs, 2 LCVPs, 2 St Cans
29	6	Long Xuyen Naval Base	Mined	Sunk: LCM 1078, LCVP 2127
30	6	XS388477	Attacked, .30-cal MG, 3 grenades	Slight damage: 1 LCVP
31	7-8	VQ960623	Attacked, .30-cal MG, grenades	Minor damage: 1 BAR hit, St Can 5041, 5042; 20-mm gun hit, LCM 1100
32	8	XS362533	Attacked, rifle	No damage: 1 LCM
33	10	WQ075680	Attacked, grenade	No damage: 22d River Group
34	11	VQ826592	Attacked, incendiary grenade	No damage: 22d River Group
35	26	WS100535	Attacked, rifle	St Can 5016/5017, 1 wounded
36	30	WQ120885	Mine	LCM 1005
January 1963				
37	3	WR428714	Launch bomb	2 LCVPs sunk
38	5	VQ856516 ^a	Mine	No damage, HQ 2206
39	5	VQ886580 ^a	Attacked, rifle	1 wounded, HQ 2207
40	5	VQ895604 ^a	Attacked, rifle	1 wounded, HQ 2206
41	8	VQ948618 ^a	Attacked, rifle	No damage, HQ 1070

^aOperation Song Tinh Thuong

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Appendix D

VC SHIP ATTACK METHODS, BASED ON VC CAPTURED DOCUMENT

SPECIAL INFORMATION BULLETIN
13 December 1962

NAVAL HQS
N2
No. 168/BTM/HQ/P2/TTK

Subj: VC Ship attack methods; Source VC document; Eval: A2 by Central Intel Service.

- A. VC Weapons used to attack ships:
 - 1. Depth charge from 6 to 100 kg
 - 2. Bazomine used to attack river craft along river bank.
- B. Disposition method for depth charge, bazomine, (shaped charge from French usage):
 - 1. Depth charge: At the chosen place drop the depth charge and stretch electric wire to the bank, each part of the line tightened with a small stone to sink the wire under water about 40 cm. At the river bank, an obstacle under the water about 1 m depth is built to prevent the discovery of mine sweeper. Depth charge is detonated electrically when ship arrives. Check of depth charge is necessary about 5 or 6 days.
 - 2. Bazomine: Use clamp to hold bazomine, placing it far from river bank about 10 m. The head of bazomine faces the river. When ship passes, aiming at the flank of the ship, right at the engine room (2/3 the body of the ship from the bow back) to launch it.
- C. Target measuring: Daytime: mark mine with floating flower pot. Night: place fireflies in floating bottle to mark mine position.
- D. Attacking anchored ships: Binding bazomine (3 to 6 kg) at neck of man, drift down stream to the objective. Tie mine at engine room, tie electric wire to the detonating pin and safety pin and release the mine, swim to the bank and detonate the mine.

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Appendix E

WATERWAY BARRICADES — A USMAAG-V NAVAL SECTION EVALUATION⁹

Waterway barricades set up by VC guerrillas prevent movement on the main avenues of military operations, logistical support, and commercial traffic in South Vietnam. They are actual and potential factors in ambushes; by slowing or stopping military operational groups and convoys, and, with partial barricades, canalizing movement, ambushes can be set up for greater effectiveness. Mines and booby traps are also used in and in conjunction with barricades.

A direct authoritative quote¹⁰ states that waterway barricades constitute one of the most important and difficult problems and that techniques for their removal constitute a prime project for R&D.

The document received is reproduced below.

WATERWAY BARRICADES

One of the major deterrents to operations on the inland waterways in South Vietnam is the emplacement of barricades by the VC. These barricades not only prevent utilization of the rivers, canals, and waterways for military operations, but also preclude their use for commercial traffic and logistic support of outlying posts.

Although there are three basic types of barricades, the one most commonly encountered is the simple log barricade. Crossed logs are placed in the waterway with bamboo and vines interwoven to give the structure strength and unity. In areas where there is a constant current in one direction, debris naturally accumulates on the up-current side. This process is supplemented by the VC by the addition of small trees, bushes, and foliage. Booby traps are often wired into the structure to complicate the removal process.

The normal method of removal of this barricade is to secure heavy lines to its main structural members and then use river craft as tractors to pull them out. Whenever possible, the LCM should be used for this task rather than the LCVP since it has twin screws and is much more powerful.

The next most common barrier is the simple mud dike. This barricade is particularly effective in canals having a tidal current. In addition to preventing through traffic by friendly forces, this barricade also assists local VC traffic since it restricts tidal effect above the dike thereby facilitating transit by non-motorized VC craft by eliminating the necessity of fighting the tidal current.

The most effective method of removal of the mud dike is with a dredge or clamshell crane. However, since this equipment is not usually available, explosive charges are normally used. If properly employed, this method is satisfactory.

The most common error is the failure of ARVN engineers to place their charges sufficiently deep in the barrier. This practice wastes time and explosives and makes ultimate removal more difficult. With the top of the dike blown off, it is much more difficult to properly locate subsequent charges.

The third and least often encountered type barricade is a combination of the mud dike and two log barricades. It is the most effective and most difficult to remove, but it is also the most complicated and time-consuming to construct. This barrier is constructed by emplacing two simple log barricades 2 or 3 meters apart and packing the area between them with mud and debris. A dredge is ineffective for removal of this type barricade but a clamshell can be utilized, if available.

The combined use of logs, and mud debris makes it difficult to effect a "clean" removal by the use of explosive charges alone. Removal of this type barricade must be effected in steps. The log barricades on either side of the mud dike must be removed in the usual manner followed by extraction of the major pieces of debris from the mud dike. The mud dike is then blown with explosives.

Intelligence reports and photographs indicate that barricades are often permitted to exist for long periods of time with no attempt being made to remove them. An orderly and continuing barricade-removal program is important for several reasons. The first, of course, is that it permits use of the waterway by friendly forces. I have heard it argued that this also opens the waterway to the VC. Such a position is obviously nonsense since the VC wouldn't barricade a waterway if such action would embarrass them.

A second, but equally important reason, is that an orderly and continuing program of barricade removal deprives the VC of valuable sources of intelligence. When barricade removal is undertaken only when required to permit waterborne movement for a military operation [this] is akin to sending the VC a copy of the operation order. Proper utilization of available forces in a continuing but random program will prevent "telegraphing our punch" and deprive the VC of a tip-off on forthcoming operations.

Corps commanders are, of course, responsible for inland-waterways in their corps area and should initiate and vigorously promulgate an organized barricade removal program. River force units should be utilized to implement this program on a continuing basis when not employed on higher priority operational missions.

Aerial reconnaissance just prior to a military operation is still necessary, of course, but the regular removal program now operates as a cover for emergency pre-operation removals. It should be emphasized that such reconnaissance must be accomplished at the time of low tide, since at high tide barricades might well be covered with water and go undetected. Even when thorough reconnaissance has been conducted, obstacles may be encountered during an operation since barricades can be constructed during a single night. The commander of every operation should ensure that at least one boat is provided with explosives, necessary demolition gear, and, if possible, ARVN demolition personnel in order to provide a capability to remove barricades encountered during actual movement in an operation.

Appendix F
RVN NAVY EQUIPMENT, JANUARY 1963

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Equipment	No.	Draft, light load/ maximum load	Armament	Loaded capacity
Amphibious flotilla				
Landing ship, tank (LST, 500, 501)	2	8' 13' 8"	2 40-mm (twin) guns 4 40-mm (single) guns 4 20-mm (twin) guns	1500 tons, 300 troops (combat)
Landing ship, medium (LSM, 400-406)	7	6' 3" / 9' 2"	1 40-mm (twin) gun 8 20-mm guns 1 .30-cal MG	300 tons, 50 troops
Landing ship, support, large (LSSL, 225, 226)	2	4' 1" / 6' 2"	3 40-mm (twin) guns 4 20-mm guns 4 .50-cal MGs 2 .30-cal MGs	60 troops
Landing ship, infantry, large (LSIL, 327, 331)	5	4' 0" / 7' 0"	1 3-in. .50-cal gun 1 40-mm gun 2 20-mm guns 2 .50-cal MGs 2 .30-cal MGs 2 81-mm mortars 2 60-mm mortars	12 tons, 70 troops
Auxiliary cargo ship (AKS; light, 451)	1	9' 4" / 10' 0"	1 20-mm (twin) gun 2 20-mm guns 1 81-mm mortar 2 .50-cal MGs	nd
Auxiliary oiler (40G, 470)	1	7' 0" / 13' 5"	2 20-mm mortars	Fuel— 53-ton (diesel)
River transport force				
Landing craft, utility (LCU, 533, 539)	7	3' 8" / 4' 2"	2 20-mm guns 1 60-mm mortar	500 troops (short trip)
Patrol flotilla				
Patrol craft (PC; 02, 04, 05, 06)	4	6' 2" / 7' 5"	1 3-in. .50-cal gun 1 40-mm mortar 2 20-mm guns 2 20-mm (twin) guns 2 .50-cal MGs 4 .30-cal MGs 1 or 2 60-mm mortars	—
Patrol craft, escort (PCE, 07-09)	3	7' 0" / 8' 5"	1 3-in. .50-cal gun 6 20-mm (twin) guns 2 40-mm guns	—
Mine flotilla				
Auxiliary mine sweep (YMS, 112)	1	7' 0" / 9' 6"	3 .50-cal MGs 2 20-mm guns 2 .50-cal MGs	—
Coastal mine sweep (MSC, 114-116)	3	7' 0" / 10' 0"	1 20-mm (twin) gun	—

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Equipment	No.	Draft, light load/ maximum load	Armament	Loaded capacity
Boats				
Landing craft, mechanized (Commandant, 1000)	na	3' 8" / 4' 6"	2 20-mm guns 1 81-mm mortar	—
Landing craft, mechanized (Monitor, 1000 series)	3	4' 2" / 4' 7"	1 40-mm gun 2 20-mm guns 1 .50-cal MG	12 troops
	3	4' 0" / 4' 3"	1 81-mm mortar 1 20-mm gun 3 .50-cal MGs	
Landing craft, vehicle personnel (LCVP, 2000 series)	na	2' 8" / 4' 4"	1 20-mm gun 3 .30-cal MGs	12 troops, 4 tons
Coast guard (40' Coast Guard, 3000 series)	na	—	—	—
Special (FOM8 and FOM11, not in RVN Navy but many in provinces)	—	—	—	—
Vedette St Can (St Can, 5000 series)	na	2' 4" / 3' 0"	1 .50-cal MG 2 grenade launchers	—
Vedette (Interceptor, 6000 series) (Interceptor, 7000 series)	na	3' 6" / 4' 0"	1 20-mm gun 1 .50-cal MG	—
Landing craft, mechanized (LCM, short)	na	3' 3" / 4' 0"	3 20-mm guns	90 troops, 30 tons
Landing craft, mechanized (LCM, long)	na	3' 7" / 4' 4"	2 .50-cal MGs	90 troops, 30 tons
Junks (command junks, various)	na	4' 5" max	1 .50-cal MG 1 .30-cal MG	20/25 troops (short trip)
Vedette (Vedette, 3000 series)	na	3' / 4'	1 20-mm gun 1 .50-cal MG	—
Landing craft, mechanized (LCM, pusher)	1	2' 6" / 3' 3"	—	—
Yard craft (YTL)	na	6" / 7' 9"	—	64 tons
HQ (HQ, 8650-8657)	8	6' / 7'	2 .50-cal MGs	—

Appendix G

TYPICAL FORMAT, US ADVISOR'S AFTER-ACTION REPORTS

SECRET

MAGAR-OT (CB)
SUBJECT: Reports

TAE A - After-Action Reports

THE FOLLOWING FORMAT IS PRESCRIBED FOR AFTER-ACTION REPORTS.
SUBMIT TO USASEC ATTN: TIC, IN TWO COPIES.

1. NAME OR IDENTITY OF OPERATION:
2. DATES OF OPERATION: Give inclusive dates and times.
3. LOCATION: Give division area, province, coordinates of general area of operation.
4. CONTROL HEADQUARTERS: Div, Regt, Bn, Sector or other as appropriate.
5. PARTICIPATING UNITS: Give detailed task organization when appropriate.
6. SUPPORTING FORCES: List air, artillery, river forces, armor, US helicopter support, etc., both planned for and actually used. Briefly indicate the extent and effectiveness for the support used to include comment on each type support.
7. US ADVISORS: Indicate the extent of US advisory effort in both the planning and execution phase. List by name the principal US advisor present with the control headquarters and the principal US advisors present with the assault elements.
8. INTELLIGENCE: Give brief estimate of VC strength and situation anticipated in objective area prior to operation to include how recent this intelligence was and upon what it was based. Make brief statement of VC strength and situation actually found as operation was conducted. Name VC units identified and any other significant VC information gained. Include overlay if appropriate. Describe briefly the terrain and weather in area of operation when material to the action reported. Include advisors' overall evaluation of effectiveness of the intelligence available and utilized.
9. MISSION: Give clear, concise statement of purpose of operation. State the objective. Indicate whether the operation was self-initiated or directed by higher headquarters.
10. CONCEPT OF OPERATION: Give brief explanation of plan of maneuver and fire support plan amplified with sketch or overlay (1:10,000 scale) when appropriate.
11. EXECUTION: Give in chronological order a narrative statement of events. Highlight significant engagements listing losses, both friendly and VC, as they occur. Include unusual tactics and techniques, civil affairs, psywar activities, deception employed, important decisions made by commanders to influence action to include use of supporting fires, commitment of reserve, etc.
12. ADMINISTRATIVE MATTERS: Note adequacy of administrative plan commenting on procedures or actions which materially hindered or aided the operation. Include

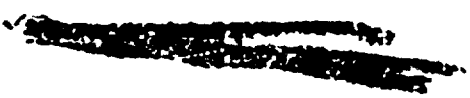
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as appropriate the following: (a) Supply, including methods and techniques of re-supply. Comment on combat loads, ammunition and weapons carried by assault troops. (b) Maintenance, standards and status observed. (c) Hospitalization and evacuation. (d) Transportation. (e) Communications.

13. RESULTS: Summarize personnel (KIA, WIA, MIA, captured, suspects arrested), equipment and materiel losses both friendly and VC. On friendly equipment losses, indicate quantities lost separately by ARVN, CG, or SDC units.
14. SPECIAL EQUIPMENT OR TECHNIQUES: Habitually comment on effectiveness of any special equipment or techniques utilized such as scout dogs, M113 personnel carriers, special air ground marking system, Armalite AR15's, M79 grenade launchers, swimmer-support boats, etc. Provide details as appropriate.
15. ADVISORY ANALYSIS: This evaluation must be complete and include an appraisal of the following as appropriate: (a) Mission assigned (was it proper and timely). (b) Effectiveness of planning. (c) Forces utilized in terms of forces available and required. (d) Adequacy of intelligence. (e) Coordination effected between political and military authority as well as between support and supported units. (f) Manner of execution. (g) Effectiveness of fire plan (was all available fire power properly used). (h) Effectiveness of communications command and control. (i) Logistical support. (j) Application of "Tactics and Techniques" handbook to include the integration of psychological, economic, and civil affairs activities prior to, during, and after the operation so as to leave a favorable GVN, RVNAF image on the people. Give brief concluding statement on success or failure of the operation as evaluated by US advisors.
16. LESSONS LEARNED: Statements with brief explanations of the major strengths and major weaknesses of the operation reported. Avoid generalities to the extent possible emphasizing significant factors influencing the action that are not common to most operations.
17. ACTIONS BEING TAKEN BY GVN UNITS IN VIEW OF LESSONS LEARNED: Additional training, etc.
18. RECOMMENDATIONS: Advisory recommendations in view of operation and LESSONS LEARNED.

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Best Available Copy



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