

RIVER CROSSING OFFENSIVE DOCTRINE

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SUBJECT: River Crossing Offensive Doctrine

1. **PROBLEM.** To determine whether river crossing offensive doctrine would be valid under circumstances which preclude the employment of both the deep-fording medium tank and the amphibious M551 reconnaissance vehicle.

2. **FACTS BEARING ON THE PROBLEM.**

a. Present river crossing offensive doctrine will not undergo major revision in the immediate future. (11)

b. Present river crossing offensive doctrine is not dependent upon the deep-fording capabilities of the medium tank, nor does it depend upon the amphibious capabilities of the M551 reconnaissance vehicle. (Annex B)

c. Both the medium tank and the M551 reconnaissance vehicle are subject to such restrictions regarding stream velocity, bank steepness, and bank height as to preclude their employment under certain conditions. (Annex D, Annex E)

d. The assault force is not doctrinally bound to cross on or below the surface of the river, but can be transported by helicopter or parachute landed. (10: 15-16)

e. Airborne, infantry, and mechanized infantry battalions have sufficient organic antitank resources to provide themselves with a limited antitank capability after crossing the river obstacle. (8: 1-2)

f. The infantry, mechanized infantry, and armored divisions have an organic capability of conducting bridging operations across water obstacles. (Annex F)

3. **DISCUSSION.**

a. The deep-fording capability of the medium tank and the swimming capability of the M551 reconnaissance vehicle, while considered as an adjunct to present river crossing doctrine, are not the basis for the development of such doctrine. (Annex B) Both hasty and deliberate river crossings have been conducted entirely without accompanying armor, using many of the principles found in present doctrine. (Annex C)

b. In my opinion, factors which would preclude the fording of tanks or the swimming of amphibious vehicles would enhance the value of a particular crossing site, in that the enemy would in all probability regard that part of his sector as an unlikely avenue of approach and leave it lightly defended. Such a situation would lend itself to a hasty crossing, the establishment of a bridgehead, and subsequent crossings of men and equipment.

c. With the increased mobility offered by rotary wing aircraft, it is now possible to land an assault force beyond the river obstacle, neutralize enemy forces along the shore, and establish a bridgehead. To assist in this method of crossing, the M551 reconnaissance vehicle can be airlifted or airdropped with the assaulting force. (15: 46)

d. One of the reasons for the early movement of tanks across a river obstacle is the requirement that the assaulting force have an antitank capability, as well as sufficient firepower to neutralize enemy strongpoints. Infantry battalions presently have this capability. (8: 12) This organic capability of the infantry battalions reduces the requirement for armor in the initial assault.

e. The bridging equipment organic to the engineer bridging company of infantry, mechanized infantry, and armored divisions is capable of transporting all armored vehicles currently in use across water obstacles up to 325 meters in width, with as little as three hours of construction time required. Necessary bank and access road preparation can be conducted concurrently with the bridge construction. (Annex F)

f. Once the river obstacle has been breached, it is essential that the momentum of the attack be maintained. While the inability to swim or ford armor may cause some delay in the employment of tanks in the attack, I feel that the attacking force could rely upon supporting artillery and aircraft-delivered fires to facilitate the establishment of a bridgehead. Once this has been accomplished, the efforts of supporting engineers can expedite the crossing of the armor. The responsibility for spearheading the offensive operation will then evolve to the armor.

4. CONCLUSIONS.

a. The inability to swim or ford armor to accompany an assaulting force, though affecting the tactical situation, would not invalidate river crossing offensive doctrine, since present doctrine takes into account the limitations of armor in river crossing operations.

b. Adequate engineer support during a deliberate crossing would largely obviate the requirement for the deep-fording of the medium tank.

c. The air transportability of the M551 reconnaissance vehicle would permit its use in a hasty crossing, without the necessity of swimming the river.


d. The potential of air-landed forces to augment a river crossing can be examined in greater detail than current doctrine affords.

5. ACTIONS RECOMMENDED.

a. No modifications be made to present river crossing offensive doctrine as regards the employment of deep-fording or amphibious vehicles.

b. Efforts be made to develop an amphibious vehicle which will be less restricted by factors of stream velocity, bank steepness, and bank height than is the M551.

c. More emphasis be placed upon the employment of heliborne or parachute landed forces to support a river crossing.


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ANNEXES:

- A - Definition and Illustration of Terms
- B - Discussion of Present River Crossing Offensive Doctrine
- C - Historical Examples of River Crossings
- D - Characteristics of M113A1 and M551
- E - Characteristics of M48A3 and M60A1
- F - Engineer Bridging Capabilities
- G - Bibliography

CONCURRENCES: (Omitted)

NONCONCURRENCES: (Omitted)

CONSIDERATION OF NONCONCURRENCES: (Omitted)

ANNEXES ADDED: (Omitted)

ACTION BY APPROVING AUTHORITY:

DATE:

Approved (disapproved), including (excluding) exceptions.

Signature

ANNEX A -- Definition of Terms, With Illustration (10:3-4, 11:1-2)

Bridgehead. A bridgehead is an area of terrain which is either held or which must be occupied on the enemy side of the river. This area will be used as the base for subsequent operations and should be sufficiently large to permit the crossing force to maneuver. In addition, the terrain within the bridgehead should be suited to a defense of the crossing sites.

Bridgehead Line. The bridgehead line is represented on a map as an imaginary line which defines the limits of the bridgehead. The ends of the line are tied in with the river on either side of the crossing site.

Crossing Areas. Crossing areas are used as control measures, and may contain more than one crossing site. A crossing area must also be large enough to permit adequate dispersion and maneuver for elements of the crossing force.

Crossing Site. The crossing site is the actual location at which the crossing will occur. The site may be a bridge, a ford, or a suitable location to launch assault boats or amphibious vehicles.

Assault Force. The assault force is the force which executes the actual crossing of the river obstacle and seizes the far shore.

Crossing Force. The crossing force is the entire force which participates in the crossing, to include supporting elements such as engineers and smoke generator support units.

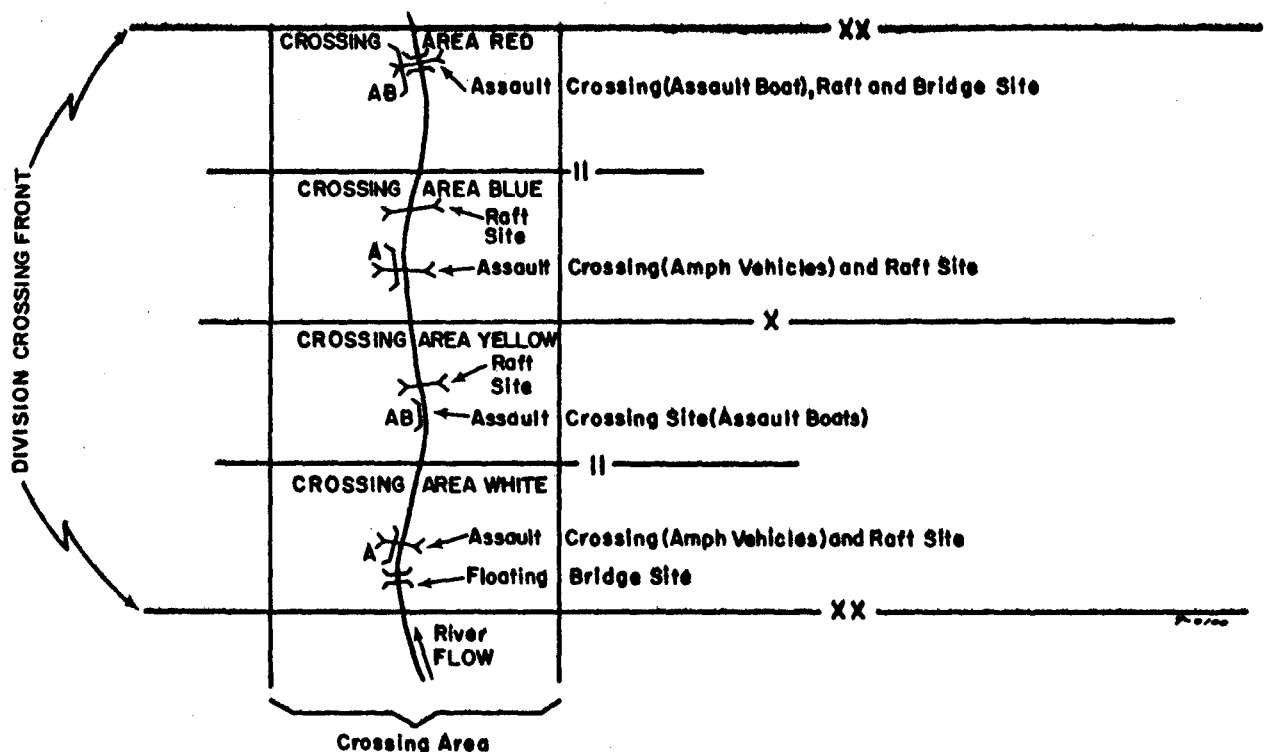


Figure 1. Schematic sketch of a division in a river crossing.

**ANNEX B -- Discussion of Present River Crossing Offensive Doctrine
(8:7-6, 10:3-5, 11:II)**

1. A river crossing operation is conducted in order to overcome a river obstacle as efficiently and as rapidly as possible, to either continue an offensive mission or to resume the offensive after conducting a defense. An additional purpose of a crossing is the establishment of security to support the crossing of subsequent units.

2. As part of his preparations, the crossing force commander must have detailed information concerning the size, composition, and location of any enemy reserves which could oppose the crossing force before the bridgehead has been secured. In addition, the commander must ensure that a detailed reconnaissance of the crossing area is conducted. Ideally, such a reconnaissance would include available maps, aerial photographs, the utilization of skin divers, and the assistance of supporting engineers.

3. The capability of the enemy to oppose the crossing force, and the nature of the river obstacle determine the type crossing to be attempted. Present doctrine envisions two types of crossings. These are the hasty crossing, or crossing of opportunity, and the deliberate crossing. The hasty crossing is favored when the enemy shore is lightly defended or when the attacking force wishes to preserve the momentum of the attack and cross without delay. A hasty crossing is also feasible when the enemy defenders can be overcome by conventional artillery, nuclear weapons, or by chemical or biological means. In addition, the assaulting force must be able to move quickly to the river without massing. This is significant in that the massing of forces would present the enemy with a lucrative nuclear target. Hasty crossings are characterized by detailed planning to ensure the availability of crossing means, swiftness of execution, and surprise. A deliberate river crossing will be attempted when the friendly force has been defending along the riverline and is resuming the offensive, when a hasty crossing has been attempted and has failed, or when the enemy is known to be strongly defending the portion of the river under consideration. The deliberate crossing is characterized by extensive, detailed planning, a deliberate massing of personnel and equipment to support the crossing effort, a delay at the riverline, and a deception to draw enemy attention away from the crossing area. Unlike the hasty crossing, a deliberate crossing requires that enemy forces be completely cleared from the near shore.

ANNEX C -- Historical Examples of the Two Types of River Crossings
(16:45-50)

1. The 71st Infantry Division was advancing toward Austria in May 1945, with the intention of crossing the Inn River and continuing the attack. Two dams offered the only readily available means of crossing the river, and both were in German hands. The decision was made to launch a rapid attack in order to seize the dams before the enemy could react. The dam at Obenberg was the target of the 1st Battalion, 66th Infantry. An attack force[^] consisting of one rifle company, a heavy machine gun platoon, a tank destroyer unit, organic antitank weapons, and supporting mortars. Under the leadership of the battalion commander, the force moved rapidly to their objective, overcoming the sporadic resistance encountered on the way. Upon their arrival at the dam, the force quickly overran the surprised German guard detachment, established a bridgehead on the Austrian side of the dam, and secured a crossing site for the remainder of the battalion and thus for the 71st Infantry Division. Two of the essential elements of a hasty crossing, speed and surprise, were employed to the fullest in the seizure of the dam at Obenberg.

2. The 34th Infantry Division was assigned the mission of crossing the Volturno River in October 1943. Extensive reconnaissance patrolling was conducted along the river, both by infantry units and by the division engineers. It was learned that the Volturno was seldom over 100 yards in width, and generally fordable, but the banks were both steep and high. Heavy rains necessitated the use of bridging equipment and caused the attack, originally planned for the night of 9-10 October, to be postponed until 12 October. During the delay further reconnaissance was conducted and troops were trained in the use of assault boats. The attack commenced on 12 October and was preceded by an artillery preparation. Some confusion arose in the execution of the attack; the assault boats were lost after the first wave crossed the river, and the remaining troops had to wade across. The guides became misoriented and directed troops to cross at the wrong places; several men were swept away by the swift river and drowned. In addition to these difficulties, supporting artillery fires fell among friendly forces and caused a number of casualties. Despite the setbacks suffered by the attacking force, the crossing of the Volturno was successful and the 34th Infantry Division was able to continue the attack northward to Rome. This operation illustrates the extensive planning, the massing of men and equipment, the delay before the river obstacle, and the detailed reconnaissance which characterize a deliberate river crossing. While these principles contributed to the success of the attack, others were violated with disastrous results. The failure to provide capable guides to the fording sites caused needless drownings. A bridging site was selected in an exposed area rather than in a defiladed location and a great deal of equipment was damaged[^] or destroyed by the enemy's direct fire. Lastly, the failure to coordinate artillery fires was responsible for the casualties suffered by the assaulting force.

ANNEX D -- Comparison of M-113A1 and M551 Characteristics (15:36, 13:3)

	<u>M-113A1</u>	<u>M551</u>
Water Crossing	Amphibious	Amphibious
Maximum Trench Crossing	66 inches	100 inches
Maximum Grade	60 percent	60 percent
Maximum Vertical Wall	24 inches	33 inches
Steering	Lateral steering	Pivot steering
Ground Clearance	16 $\frac{1}{8}$ ⁱⁿ inches	19 inches
Maximum Allowable Current Speed for Swimming	1.5m/sec	1.5m/sec

ANNEX E -- Fording Capabilities of the Tanks M48A3 and M60A1 (15:48-52)

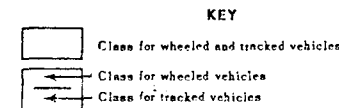
	<u>M48A3</u>	<u>M60A1</u>
Water Fording	48 inches	48 inches w/kit 96 inches w/deep water kit 162 inches
Maximum Trench Crossing	102 inches	102 inches
Maximum Grade	60 percent	60 percent
Maximum Vertical Wall	36 inches	36 inches
Maximum Allowable Current Speed for Deep Fording		1.5m/sec

Table III. Floating Bridges

1. Type of bridge	2. Transportation required ¹	3. Construction Party ² /Construction Time ³ (hours)			4. Maint crew (No men)	5. Load classes ⁴															6. Traffic capacity and vehicular distance for safe crossing in daylight (except as otherwise noted) ¹⁰				
		Stream width (meters)				Safe crossing (posted capacity) ⁵			Caution crossing ⁶						Risk crossing ⁷										
		Up to 80	80-160	160-325		Stream velocities in meters per second (m/s)																			
		1	2,3	2,6		3	3,6	1	1,6	2,3	2,6	3	3,6	1	1,6	2,3	2,6	3	3,6						
2. Footbridge, aluminum	1 2½-ton truck and 1 2½-ton pole trailer per 77.4 meters of bridge.	1 Plat	1 Plat	---	1 Sqd	Safe															Day: 70 men per min Night: 40 men per min at 2-pipe distance. ⁹				
3. Light tactical bridges	2 2½-ton truck and 1 2½-ton pole trailer per 14.4 meters of bridge.	1 Plat	2 Plat	---	1 Sqd	16	16	13	11	8	2	18	18	15	12	9	3	21	21	17	14	11	5	400 vehicles per hr 30 meters distance between vehicles. ¹⁶	
4. M4T6 ¹⁰ float bridge	Normal	1 Co	2 Co	2 Co to 1 Bn	1 Sqd	50	45	40	35	30	25	60	58	54	42	45	35	68	66	62	50	54	45	400 vehicles per hr ¹⁶ 30 meters distance between vehicles.	
	Reinforced	2-3	3-5	5-10		75	75	70	65	55	27	80	80	79	73	62	53	96	92	90	87	81	72		
5. Class 60 floating bridge	Normal	1 Co	2 Co	2 Co to 1 Bn	1 Sqd to 1 Plat ¹⁴	60	55	50	45	40	35	25	65	62	56	52	45	84	79	77	72	67	62	400 vehicles per hr 30 meters distance between vehicles. ¹⁶	
	Reinforced	2-3	3-5	5-10		65	65	65	65	65	30	73	75	75	75	65	47	85	85	85	85	85	70		
6. M4 floating bridge (limited standard)	Normal ¹²	1 Co	2 Co	2 Co to 1 Bn	1 Sqd to 1 Plat ¹⁴	60	60	45	45	30	18	68	65	58	52	44	29	72	68	61	58	53	47	400 vehicles per hr 30 meters distance between vehicles. ¹⁶	
	Reinforced ¹³	1 Co	2 Co	2 Co to 1 Bn		95	95	75	60	45	24	100	100	88	75	62	35	105	105	100	88	73	45		
7. Mobile Assault Bridge/Ferry (MAB) (MFABF)	Number of interior units = bridge length (m) - 20 7.92 (plus 2 ramp units)	Note 15	Note 15	Note 15	Note 15	62	62	55	55	(Ratings are tentative)															400 vehicles per hr 30 meters distance between vehicles. ¹⁶
8. Amphibious river crossing equipment (ARCE)	1 Amph bkg veh per 8.0 meters of bkg exclusive of 8.0 meters ramp at each end of bkg & 2 amph ramp carriers or 1 ST tractor w/25 ton low bed tr.	Note 15	Note 15	Note 15	Note 15	60	60	55	55	(Ratings are tentative)															400 vehicles per hr 30 meters distance between vehicles. ¹⁶
		1	1½-2	1½-3																					

¹Transportation for bridge equipment only. Additional needed for any construction equipment required, and for troops.
²Average for trained troops and continuous daylight assembly. Allowances are required for specific situation and the longer spans.
³Includes unloading and assembly only in daylight. Does not include access roads, assembly sites, abutments, or anchorages. Does not include conversion from highway travel condition to water entry configuration for the ARCE units. Time is based on use of trained troops and no delays. Average time with 2 assembly sites.
⁴Based on abutment at levels within 12-in of floating bridge deck level.
⁵Vehicle anywhere on bridge deck between curbs. Speeds up to 40 kph permitted, but 24 kph recommended. Vehicle spacing, 30 meters.
⁶Center of vehicle within 12 in of bridge centerline. Maximum speed 13 kph. Vehicle spacing 50 meters. No stopping, accelerating, or gear shifting.
⁷Center of vehicle within 9 in of bridge centerline with guide. Maximum speed 5 kph. One vehicle on bridge. No stopping, accelerating, or gear shifting.
⁸Traffic capacities are for all traffic moving forward or rearward.
⁹Reduce capacity 20 percent for currents of 3 to 3.6 mps.
¹⁰Ratings based on 18 balk curbs (166¼ in) in 22 balk wide superstructure.

¹¹60-ton tanks having tread widths of 143 inches or more may cross safely up to 2.3 mps.
¹²Ratings based on use of reinforcing ponton in end span and 18 balk between curbs (166¼ in) in 22 balk wide superstructure.
¹³Ratings based on use of double deck and span, 100 percent reinforced floating section and 20 balk between curbs (185 in) in 24 balk wide superstructure.
¹⁴Depending on length of bridge and general conditions.
¹⁵Only MAB crews are required, plus bank and access road preparation as needed.
¹⁶Based on ideal approach and ramp angle conditions.



ANNEX F -- Engineer Bridging Capabilities (10:67)

ANNEX G -- Bibliography

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