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DIGEST of REPORTS on OPERATION "HUSKY".

1. Digest of reports on Operation "HUSKY" is forwarded herewith.

S.1542

B.

Combined Operations Headquarters,
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Whitehall,
London, S.W.1.

CT/641/E/43.
1 Nov. 1943.

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18 July '44 per Authority
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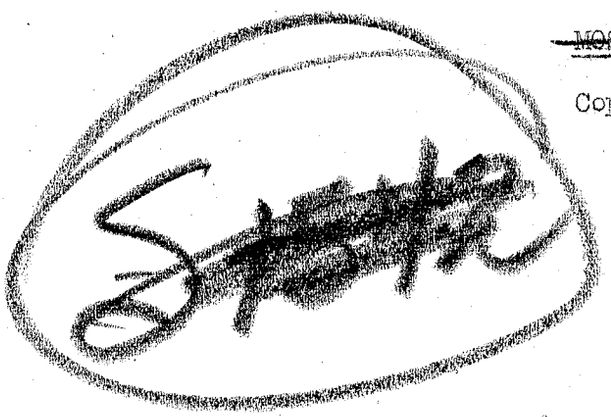

C O M B I N E D O P E R A T I O N S

DIGEST OF SOME NOTES AND REPORTS FROM OPERATION "HUSKY"

(Allied landings in SICILY in July, 1943.)

Prepared under the direction of the
Chief of Combined Operations.

October, 1943.

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MONTHLY INFORMATION SUMMARY and BULLETINS OF GENERAL INTEREST

DISTRIBUTION LIST.

To	Copy No.
Section 1. ADMIRALTY.	
Deputy First Sea Lord	1
A.C.N.S.(W)	2
A.G.R.M.	3
D. of P.	4
D.T.S.D.	5
E. in C.	6
D.N.C.	7
D.S.R.	8
D.N.E.(C.O.)	9
D.M.W.D.	10
Assistant Controller (R & D)	11
D.R.O.(C.O.)	12
D.D.R.O.(C.O.)	13
D.C.O.M.	14
Section 2. WAR OFFICE.	
A.D.I.G.S.	15
D.M.O.	16
D.M.O.(M.O.I.(S.P.)) through S.M.L.(C.O.H.Q.)	17
D.M.O.(M.O.3.)	18
D.M.T.(M.T.6(C.O.))	19
Scientific Adviser	20
D.S.D.(S.D.5(a))	21
D.R.A.C.	22
D.R.A.	23
D.Sigs	24
D.Int.	25
D.W.V.	26
Brig. Q Ops	27
D.Mov.	28
D.Mov(Q.M.6)	29
D.Tn.	30
D.Tn (Tn.1)	31
D.S.T.	32
E. in C.	33
E. in C. (E.Ops)	34
D.M.E. (D.D.M.E.(W))	35
Col. Abraham. Q Ops.	36
Section 3. AIR MINISTRY.	
D. of Ops (T.A.C.)	37
D.O.R.	38
D.A.T.	39
D.D.T.C.O.	40
A.C.A.S.(P)	41
A.C.A.S.(I)	42
D.G. of S.	43
D.W.O.	44
D. of Mov.	45

Section 4./...

To	Copy No.
Section 4. C.O.S.S.A.C.	
H.Q., C.O.S.S.A.C. and for distribution as follows :-	46 - 54
Naval Branch (BR) Army Ops Branch (BR) Air Branch (BR) ADM Branch (BR) D.D. (Mov.Tn) Major-General Intelligence Army Ops Branch (U.S.) C.M.S.F. (Room 516)	
Section 5. C.C.O.R.	
C.C.O.R. Washington and for distribution to following Authorities :-	55 - 69
Operations Division, War Department General Staff. G.3, War Department, General Staff. Commanding General, Army Ground Forces. Commanding General, Army Air Forces. Amphibious Section, Readiness Div. Office of COMINCH, U.S. Navy. Commanding General, Army Service Forces, War Department. Commandant, U.S. Marine Corps, Headquarters, U.S.M.C., Arlington, Va. Commanding General, Command & General Staff School, Fort Leavenworth, KANSAS. Commander, Pacific Fleet Amphibious Force, San Diego, Cal. Commanding General, Officer of Strategic Services, Washington, D.C. Commandant. Army & Navy Combined School, New War Department, Washington D.C. B.A.S. D.C.E.(B.A.S.)	
Section 6. U.S. FORCES.	
Comdr. Atlantic Fleet Amphibious Force. (to U.S.N.O. for forwarding)	70 - 73
Military Attache, American Embassy. Grosvenor Square.	74
Section 7. H.Q. ETOUSA.	
H.Q. ETOUSA and for distribution to following :-	75 - 82
(G.4) (G.3) Ordnance Department	

Lt.Col.Norton/...

To	Copy No.
Lt.Col. Norton, U.S. Assault Training Centre Appledore.	
Chief Intelligence Division.	
Publications Division.	
Section 8. ROYAL MARINE & ARMY FORMATIONS & UNITS AND TACTICAL AIR FORCE	
21 Army Group (G.(Ops)) Branch for internal distribution :-	83 - 89
H.Q. Second Army	90 - 91
G.O.C. 1 Corps	92 - 95
H.Q. 8 Corps	96
H.Q.12 Corps	97
G.O.C. 3 Div.	98
G.O.C. 49 Div.	99
G.O.C. 79 Armd. Div.	100
Comdr. 101 Sub Area (Beach)	101
" 102 " " "	102
" 104 " " "	103
R.M. Military School, Thurlestone.	104
Cmdt. Obstacle Assault Centre, Aldershot.	105
T.A.F. H.Q.	106
No.83 Group Main H.Q. Gatton Park, Reigate.	107
No.83 Group Rear H.Q. RAF Station, Gatwick, Surrey.	108
No.84 Composite Group.	109
G.S.O.1 Kilbride Bay, Trg Area, Tighnabruaich	110
C.O. Royal Marines, Towyn, Wales.	111
S.S. Group H.Q., c/o G.H.Q. Home Forces.	112
1 Special Service Brigade	113
2 " " "	114
3 " " "	115
4 " " "	116
Section 9. COMBINED OPERATIONS NAVAL AUTHORITIES and BASES.	
R.A.C.O.B. (W.A.)	117
S.O.L.S.U.	118
Commodore C.O.B.	119
Captain M.L.C.	120
S.O. Force J.	121
Captain J 1.	122
Captain J 2.	123
Captain J 3.	124
Captain J 4.	125
H.M.S. EFFINGHAM	126
LOCHAILORT	127
STOPFORD	128
ARMADILLO	129 - 130
PASCO	131
JAMES COOK	132
HELDER	133
NORTHNEY	134
TORMENTOR	135
FOLIOT	136
WESTCLIFF	137
TURTLE	138
LIZARD	139
SEASERPENT	140
NEWT	141

H.M.S. SQUID/...

To	Copy No.
H.M.S. SQUID	142
MYLODON	143
WILDFIRE III	144
ARBELLA	145
HAIG	146
ALLENBY	147
ROBERTSON	148
Commander J, H.M.S. TORMENTOR	149
R.N. Unit, Calshot.	150
H.M.S. PAULINE	151
MEDINA	152
MANATEE	153
SALCOMBE	154
MASTODON	155
C.O. C.O.P.P. Depot, Hayling Island.	156
H.M.S. CRICKET	157
Section 10. COMBINED TRAINING ESTABLISHMENTS.	
C.T.C. Largs.	158 - 159
Appledore.	
C.O. H.M.S. APPLEDORE.	160
C.O.X.E.	161
Inveraray.	
C.O. H.M.S. QUEBEC	162
Comdt. Army Wing C.T.C.	163 - 164
C.O. Army Tank Wing.	165
AD Tn C.T.C.	166
Dundonald.	
Commanding Officer, H.M.S. DUNDONALD	167
Comdt. C.T.C.	168
C.R.E. C.T.C.	169
G.S.O.1 T.T. Wing.	170
O.C. No.1 Bombardment Unit.	171
Commanding Officer H.M.S. DUNDONALD II	172
O.C. R.Sigs Wing.	173
105 Wing.	174
Toward.	
C.O. H.M.S. BRONTOSAURUS	175
Comdt. C.T.C.	176
C.R.A.S.C. C.T.C. Livingstonia Hotel, Rothesay, Isle of Bute.	177
Dorlin.	
C.O. H.M.S. DORLIN	178
Chief Military Instructor C.T.C.	179
Section 11. AUSTRALIA.	
A.C.O. Australia.	180 - 182
Comdt. C.T.C. Australia.	183 - 185

To	Copy No.
Maj.Gen. R.H. Dewing, C.B.,D.S.O.,M.C., Senior Officer U.K. Liaison Staff, 233 Domain Road South, YARRA, Victoria.	186
N.L.O. Australia House.	187
Australian Army Rep. Australia House.	188 - 189
Section 12. CANADIAN FORCES.	
Canadian Naval H.Q.	190
Sec Naval Bde Naval Service H.Q. Ottawa.	191
Canadian Military H.Q. (S.D. Weapons)	192 - 194
G.O.C. 1 Cdn Corps	195
G.O.C. 3 Cdn Div.	196
Comdt. C.T.C. Canada.	197 - 201
A.A.&Q.M.G. Canadian P.S.	202
Senior Canadian Naval Officer (London), Navy Office of Canada, 10 Haymarket, London S.W.1.	203
Section 13. MEDITERRANEAN.	
C. in C. Mediterranean	204 - 213
C. in C. Levant	214 - 216
C. in C. Middle East.	217
D.C.O. Middle East and for distribution to :-	218 - 222
C.T.C. Kabret H.M.S. SAUNDERS C.T.C. Tripoli etc.	
M.G.C.T. Middle East.	223 - 225
C.T.C. Middle East.	226 - 228
Section 14. NORTH AFRICA.	
C.O.S. Allied Force H.Q.	229 - 230
Comdt. C.T.C. North Africa.	231 - 233
Section 15. INDIA.	
C. in C. India.	234
C. in C. Eastern Fleet.	235 - 237
B.G.S. War Staff. India Office.	238 - 239
D.C.O.(I) and for distribution	240 - 254
Rear Admiral Miles, Naval Force Commander, H.Q. I.E.F. India.	255
Supreme Allied Commander, S.E. Asia. (Combined Operations Division)	256 - 262
Section 16. MISCELLANEOUS.	
C. in C. Portsmouth	263
Plymouth	264
Nore	265
Western Approaches	266
Rosyth	267
Q. Planning School, 63 St. James St.	268
D.G.R.S.D. Min of Supply (Addressed Dr. H.J.Gough C.B.,F.R.S.)	269
R.E.7, Min of Supply.	270

Admiral Cmdg./...

Tc	Copy No.
Admiral Cmdg. Orkneys & Shetlands, Lyness, Orkney.	271
Lt.Col.Colbeck, S.O.S. Oxford.	272
Planners on detached service overseas.	
Lieut. P.H.J. Southby.	273
Lt.Col. H.S.P. Barstow.	274
Lt.Col. R.D.Q. Henriques (to PA/CMP)	275
Major I.G. Collins (to PA/CMP)	276
Section 17. INTERNAL DISTRIBUTION.	
C.C.O.	277
F.O.C.C.O.	278
C.O.S.	279
D.C.T.	280
C.N.T.S.D.	281
D.X.Q.R.	282 - 286
Captain L.B.	287
D.N.C.S.	288
C.S.O.(C.O.)	289 - 291
C.N.P.	292
Q. Planners	293
N.P.1(D)	294
S.O. Force 'S'	295
Army	
G.O.C.C.O.	296
M.G.C.T.	297
C.O.J.P.	298
C.E.C.C.O.	299
P.S.	300 - 302
T.M.A.Q.	303
Lt.Col. Moulton, G.1 Liaison.	304
T.M.G.2(1)	305
T.D.S.	306
C.M.S.D.	307
S.I.O.	308
C.P.C.	309
C.M.P.	310
M.R.Q.3	311
Air Force	
A.O.C.C.O.	312
S.A.S.O.	313
C.A.P.	314
United States.	
U.S.A.C.C.O.	315 - 317
W.D.1.	318 - 319
Central Registry	320
File	321 - 322
Spare	323 - 350

C.O.H.Q. MONTHLY INFORMATION SUMMARY
AND BULLETINS OF GENERAL INTEREST.

ADDENDA TO DISTRIBUTION
LIST.

	Copy No.
Military Attache, American Embassy, 1 Grosvenor Square, W.1.	324 - 329
D.G. of S. (Air Ministry)	330 - 331
A.C.A.S.(Ops)	332
D.B.(Ops)	333
D.O.(Ops)	334
F.O.I.C. Milford Haven	335
H.Q. E.T.O.U.S.A.	336 - 341

This Headquarters has received many reports on "HUSKY" whi vary greatly in quality, length, value and interest. Their circulation would require tons of paper and few people would have time to read them. An attempt has therefore been made to digest them into the following paper. That Digestion has not been entirely successful can be sensed by the periodical repetition which cause the paper to lack continuity. But it is not so much intended to be read from cover to cover as to enable officers to glance quickly at any points noted concerning the particular aspect in which they are interested.

The paper is based on opinions, not approved lessons. As far as possible really unsound opinions have been omitted but certain contentious statements have been included as likely to provoke argument and thus possibly an agreed solution.

None of the reports from which the paper has been prepared has any official status.

Lastly, officers concerned in across channel operations should bear in mind the fundamental differencesbetween the two problems. "HUSKY" enjoyed tideless waters, fine weather, moderate defences and a surprised and half hearted Italian garrison. Such conditions are unlikely to obtain in operations against the N.W. coast of Europe.

CONTENTS.

TRAINING.

1. The following points arose during training and as a result of the operation.

(a) When a Formation is training for a particular operation a general directive should be given at an early date stating the broad outline on which training is to be based.

(b) It is essential for a proportion of Staff Officers to receive instruction in the staff problems of a combined operation before formations start detailed planning and training.

(c) Competent signal experts from the three Services are required at C.T.C's so that communications may be rehearsed and perfected.

(d) To obtain realism and maintain troops interest, a generous allotment of landing craft for training is required. If only a few craft are allotted for training, the Naval Commander responsible will naturally be loth to risk them in carrying out scramble landings, etc., at night or in adverse weather conditions. The type of craft in which troops are to do the actual assault should be used whenever possible.

(e) Few aircraft were available to co-operate during training. These, if they can be spared, are of great help in adding realism and improving the standard of aircraft recognition.

(f) Training in recognition of aircraft and fire control of A.A. require great consideration and improvement.

(g) Naval training of landing craft crews should if possible be completed before work is started with the Army. Failure to do this will result in mistakes in the early stages of combined training which will tend to diminish the Army's confidence in the Navy's ability to get them to the right place at the right time.

(h) Further study and experiment is required in getting troops quickly ashore from L.C.I.(L) and in getting Anti-tank guns and artillery across the beaches.

(i) Beach Groups should be given adequate facilities for training and should be married up with Assaulting Brigades for their collective training and rehearsals. Sufficient training equipment should be made available to avoid use of operational equipment.

(j) A.M.L.O's. and other Beach Group or Naval Officers who work on the beach require training in the capabilities of the different types of Mechanical Equipment.

(k) Units should practice their drivers in all stages of waterproofing vehicles frequently. The main reason for drowned vehicles still remains that of bad driving.

(l) Training in handling awkward stores is necessary. Examples are Bailey bridging, 6 feet packing cases and Sherman tank engines.

(m) The necessity for speed in disembarkation and transit through the beach during the first two or three hours should be stressed.

(n) In future exercises, it might be advisable intentionally to land a proportion of key personnel on the wrong beaches.

2. Certain "rules" for adoption in the plan for landing Regimental Combat Teams of 3rd U.S. Division and points noted as a result of planning are given in Annexures "A" and "B".

THE ASSAULT.

3. The assault was carried out on a moonless night with zero timed for two hours before nautical twilight. No preliminary softening of the beaches had taken place. Defences consisted of wire in one or two rows immediately behind the beach with, in some cases, mines laid behind the front row of wire. Pillboxes were sited to enfilade the wire. Mortar and artillery fire, when met with, were brought down on the water's edge. The enemy were surprised and did not shew determined resistance.

Points Noted.

4. (a) Although the assault was on a moonless night, there is always a certain amount of light in the MEDITERRANEAN and it is doubtful whether a moonless assault would have been feasible in the much darker conditions found in the channel.

(b) Routeing of large naval convoys during darkness within a confined area without collision or confusion was successfully achieved.

(c) Silhouettes produced from air photographs gave a false impression as the photos were taken from too high an altitude. Those drawn by submarines were excellent and in many cases put flotillas on the right road.

(d) The duty of making contact with submarines should be undertaken by several ships in the convoy to ensure against a technical failure in any particular ship. In this operation several convoys failed to contact their submarines with the result that their release positions were incorrect.

(e) A navigational leader such as an L.C.P.(N) should be carried in the same ship as the assault craft. In this operation, due to the bad weather, several M.L's. arrived too late or with their navigational aids out of order.

(f) The necessity for good control of all assaulting craft. This might be improved by having D.S.N.O.L. aboard Bde. H.Q. L.C.I.(L) with wireless communication on Landing Wave with the assault craft.

(g) Groups of landing craft working under each S.N.O.L. should be marked with distinctive signs which can be easily recognised if they stray outside their sectors.

(h) Flotilla forming up on leaving L.S.I.

(i) The flotilla officer should remain in touch with the Commanding Officer of the L.S.I. to the last minute to get his position at the time of leaving and his course to the right beach.

(ii) Various methods of forming up were used. Some circled their ships, others circled each their own side of the ship, others left the ship and just kept head on to the sea till they were picked up by their guide. It is suggested that GLENGYLE'S drill where the weather side craft circle until formed up, then cross the bows and are joined by the lee side craft, which have been waiting alongside, seems to have a lot to recommend it in the rough weather experienced. The policy needs settling and teaching to all concerned.

(j) M.T. ships and L.S.I. should carry boards with code numbers in large letters on each beam and quarter to enable landing craft to find their ship.

(k) Flank landings in unexpected areas followed by an attack on the main beach from the landward side, may often prove the best and least hazardous method of assault.

(l) Overloading the infantryman in the assault must be resisted if he is to wade through deep water, or clamber over difficult places.

(m) The landing of tanks, vehicles and personnel over rocks should be further examined. This may assist surprise and give greater immunity from mines, wire and Anti-tank guns.

(n) A more efficient method of waterproofing wireless sets is required.

(o) Certain Key Officers directing the initial assault should be provided with waterproof watches and torches.

SUPPORT OF THE ASSAULT.

5. Bombardment.

Bombardment was carried out by 'Support Groups' of cruisers and destroyers. Prearranged and opportunity targets were engaged. F.O.O.'s. and Air O.P's. were used for observing fall of shot, and results appear to have been satisfactory.

6. Points noted.

(a) During the operation F.O.O's showed lack of appreciation as to the fire power required to engage targets. Instances occurred of six inch cruisers being asked to engage enemy O.P's when 4 inch guns would have been quite adequate. More stress should be laid on this fact during training and F.O.O's should learn to consider ammunition situation, wear of guns etc.

(b) When targets are being engaged by air O.P's, pilots should give corrections to fall of shot, which is the normal procedure and not report fall of shot itself. The latter method appears to have been used.

(c) F.O.O's which of necessity should be mobile, had to rely on transport being loaned to them by formations already landed. This proved unsatisfactory. In order to remedy this it is suggested that each F.O.O. party, should be given an armoured O.P. or white scout car. This would have an added advantage in that it would be possible to carry wireless sets of greater range and duration than the present sets, which are designed for manhandling, and at times failed owing to their short duration and range.

(d) Doubt arose as to who should control F.O.O's in battle. It is suggested that F.O.O's should be controlled by the Senior Artillery officer with the formation concerned and not by the S.B.L.O.

(e) In planning the Army did not always appreciate that orders have to be circulated to all units of the Fleet and therefore should be available early.

(f) If F.O.O's are to engage targets with accuracy and speed they should study maps and models of the area of operations and know the battalion plan at an early stage.

(g) Provision for the supply of new wireless batteries for F.O.O's. after the assault should be made.

(h) Administrative arrangements should be made for the maintenance of F.O.O. parties who arrive at Army as individual and unco-ordinated bodies.

Close Support.

7. In addition to bombardment by 'Support Groups' of Cruisers and destroyers every other possible provision was made for giving naval support. Methods included:-

(a) L.C.S. on opportunity targets.

(b) The American use of L.C.S. firing grapnels in advance of the first assault wave, which was successful.

(c) L.C.G. decentralised under Support Groups.

(d) All possible infantry weapons mounted in L.C.V. of American assault battalions.

(e) The Americans sacrificed loading space in L.C.T. so that tanks and S.P. guns could fire during the approach.

(f) The mounting of the maximum possible number of A.A. guns - 40 mm, 37 mm, and 20 mm, - on the upper deck of L.S.T. which were thereby converted into auxiliary flak ships.

(g) The decentralisation to Support Groups of L.C.F.

(h) The use of L.C.T.(R).

ANTI-AIRCRAFT.

Vulnerable Areas of a Beach.

8. 90% of enemy air attacks were directed on shipping lying with-

in two miles of the waterfront. Very few attacks were made on beached craft or on vehicles immediately in rear of vehicle landing beaches. In the Beach Maintenance Area dispersed dumps offered difficult targets which were attacked unsuccessfully.

9. For this reason guns should be sited to give maximum protection to the waterfront and shipping off shore. The Beach Maintenance Area requires light cover with heavier cover at exit roads and vehicle assembly areas when formed. It might here be stressed that more casualties were suffered by Beach Groups from A.A. fire than from any other cause, the Naval Oerlikon being a major offender owing to its non-self destroying shell. The final policy adopted was for Naval A.A. to fire only to seaward.

Beach A.A.

10. Units for beach defence were under command of Beach Groups. Planning was on a divisional level and in most cases Beach Group Commanders attended divisional conferences without their A.A. Commanders. This system caused bad results for the following reasons:-

(a) Insufficient priority was given to A.A. on one of the most important beaches.

(b) Some Beach Group Commanders attempted to dictate the equipment to be taken by beach A.A. units.

(c) There was no liaison with the R.A.F.

(d) An area layout for nearby adjoining beaches was not considered.

11. The conclusions from the above are:-

(a) Beach A.A. should be in support of and not under command of Beach Sub Areas. A.A. Commanders should take part in divisional planning assisted by Corps and Army directives, laying down for example, that a proportion of L.A.A. guns must be landed in the first flight of wheeled vehicles and that H.A.A. must be landed so as to be in action by nightfall.

(b) One A.A. Commander should be appointed for every area in which the fire of H.A.A. portecting one V.P. can support H.A.A. protecting another V.P. This Commander should land early on D day in order that the whole layout is made to work on D day.

(c) Similarly Regimental Headquarters should land on D. day and not days later.

12. The action to be taken by landing craft actually discharging when an air raid occurs should be laid down in orders.

THE WORKING OF THE BEACHES.

General.

13. Maintenance over the beaches was well and speedily carried out. Conditions for the build-up were good, with little enemy interference, fine weather and calm seas. Both 7th and 8th Armies proved that under these conditions and with adequate small craft and DUKWs, maintenance of large forces over captured beaches is not only possible but under conditions pertaining in the Mediterranean, easier than expected.

14. Figures of stores handled over beaches are given in Annexure "C".

Beach Organisation.

15. Three types of Beach Organisation were used:-

(a) The Middle East Brick.

(b) The North Africa Beach Group (based on U.K.)

(c) The American Beach Group.

(a) and (b) were based on an infantry battalion, strength about 2700, with Signal, Engineer and Service personnel and also L.A.A. and H.A.A. under command. They normally operated on one beach. (c) was based on three engineer battalions each reinforced with Signal and Service personnel including naval personnel under command. In the case of (a) and (b) naval personnel worked with the Army Beach Personnel but not under command. Three reinforced engineer battalions, which formed an Engineer Shore Regiment could work three beaches. Strength was about 4500 personnel.

16. Each of these organisations worked very well. Commanders of Middle East Bricks and the majority of observers are of the opinion that the present organisations of both (a) and (b) are sound and that no drastic reorganisation is required.

Points noted.

17. (a) Beach organisations which at present differ in the U.K., NORTH AFRICA and the MIDDLE EAST should be standardized.

(b) It is most desirable that the personnel of beach organisations should not be changed, thereby lessening the chances of building up esprit de corps; and a beach group is an organisation which takes a considerable time to weld together and train, and therefore should not be broken up unless circumstances fully justify it.

(c) The same naval parties should work with the same beach parties.

(d) A battalion should form the nucleus of a Beach Group.

(e) A maintenance organisation for DUKWs should be added.

(f) Transport should be provided for P.M.L.O's.

(g) Beach groups should not be regarded as a general pool from which formation staffs can take extra transport, fighting troops, etc.,

(h) Men used for Beach Group Provost should be of the R.A. Scout type used to traffic control and capable of giving information as regards the beach layout, units passed through, etc.,

(i) Either Beach Group personnel should be trained in bomb disposal or a bomb disposal detachment should form part of the Beach Group.

(j) The establishment of the O.B.D. should be increased.

Beachmasters.

18. The successful use of beaches will depend to a very great extent on the ability and qualities of certain key personnel such as Beachmasters, P.M.L.Os and M.L.Os. In many instances only very junior naval officers were available at the outset as Beachmasters. They were often incapable of handling difficult situations which arose as a result of surf, swell, wind and crews in a state of exhaustion.

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This operation showed beyond doubt that these key personnel should be officers of outstanding ability, capable of asserting themselves and taking command of the situation in addition to having first class technical knowledge.

Equipment.

19. Experiences suggest that the increased provision and greater use of mechanical aids will do much to speed up the rate of discharge particularly in the first few days. Suggestions for improvements in the use and additions to the scales of present equipment are dealt with below.

(a) Naval Pontoon

This equipment proved itself the best for bridging the water gap and was most successful. The following points are stressed with a view to increasing its future efficiency.

(i) Towing sections behind L.S.T.(2) (the British method) resulted in five out of eight sections being lost during the storm on D-1/D. As L.S.T. (2) is unable to pick up loose sections, in the future a tug might well tow the rafts or be with the L.S.T. convoy for use in emergency.

(ii) Compressors should be provided for emptying pontoons.

(iii) Its use in tidal waters both as a pier, or in the form of a 175 ft by 30 ft raft as a ferry should be further examined.

(iv) Its use during this operation to form small docks at which L.S.T. and L.C.T. could discharge and alongside which L.C.M. could discharge was found to speed up unloading considerably. A sketch is given in Annexure "D".

(b) Beach Roadway

SUMMERFELD, CYCLONE and ARMY TRACK were used. All proved good but of the three "skeltonised SUMMERFELD" with hessian, as used by the American Seventh Army, will probably give the quickest and most satisfactory results, especially under difficult conditions. ARMY TRACK was heavier than either CYCLONE or SUMMERFELD and broke more easily. In addition to wire track a reinforcement of "CHESPALING" (wooden paling in rolls) was used to deal with difficult places, corners etc.

Seventh Army found that DUKWs (dripping water as they leave the sea) are excellent beach road preservers.

The laying of SUMMERFELD can be speeded up by Bulldozers towing sledges loaded with 36 ft. prefabricated packs. 400 yards of track can be loaded on six sledges.

(c) Bulldozers

Both D.4 and D.7 were used. The D.7 was more efficient than the D.4 which failed to compete with work such as movement of stone walls, boulders and dragging of JAHN trailers in soft sand. All

Bulldozers should have bulldozer or angledozer blades and winches. Bulldozers should be the first vehicles disembarked from L.C.T.'s.

D.4s should if possible be replaced by D.7s.

(d) Roller Runway

This proved extremely useful in assisting the discharge of landing craft and L.S.T. In future every craft carrying stores might well carry roller runway. From this operation it is thought that 12 lengths per L.C.T. and 24 lengths per L.S.T. should be carried. Alternatively, as a means of economy, roller runway might be made a beach group store on a scale of 3200 feet per beach group.

(e) Cranes

Cranes should be increased to the following scale within the Beach Group, an increase of four on the present scale:

(i) Two in O.B.D.

(ii) One in D.I.D.

(iii) One in petrol depot.

(iv) Two on beaches for unloading L.C.Ts.

(f) Fire Equipment.

Less heavy and more fire equipment should be provided for the dump areas.

(g) Sleighs.

The large pattern sleigh was found to be unwieldy: the small pattern is much more satisfactory.

(h) Beach Lights.

The present type are too weak. Lights should be visible from the Waiting Position.

(i) Tape.

The American tape, 6 inches wide, impregnated with luminous paint proved excellent and can be seen 100 yards away even on a dark night.

Maintenance Through Beaches.

Points noted.

20. (a) The need for still further examination in the bridging the water gap, in spite of the very efficient part played by the American Naval Pontoon and the DUKWs.

(b) The fear that beaches would deteriorate rapidly under extensive use proved to be groundless on this operation.

(c) Ships should anchor as close to the beaches as possible once coast defences have been overcome. This renders them less likely to sink when bombed and more immune to submarine attack. It also brings them within closer protection of the beach A.A. and has the overwhelming advantage of shortening the turn round.

(d) The usefulness of a quay in a small Port such as LICATA which enabled L.S.T. to discharge at a far greater rate than was possible over the beaches.

(e) After false beaches have been blown away the tendency is for anything except shallow cuts to silt up. It was found that shallow cuts were automatically kept open by the propeller action of L.C.Ts. going backwards and forwards.

(f) One vehicle for Beach Group Provost should be landed early to enable the Beach Group area to be properly signposted.

(g) Efforts by Corps, etc. to have Maintenance Area well inland should be resisted as it lengthens turn round of vehicles and so slows down discharge.

(h) Grave digging should be planned.

(i) The tonnages and scales of ammunition to be landed should be known in advance in order that dump planning and preparation of stock pro fornac may proceed.

(j) Beach groups should be prepared to ration and accommodate in bivouac area large numbers of extraneous personnel, survivors from sunken ships, etc.,

COMMUNICATIONS.

U.S. 3rd Division.

21. Communications within this Division, although all steps had been taken to triplicate and quadruplicate them, were for the most part a failure during the early stages of D day. It is suggested that the introduction of visual methods on a much larger scale for use during this vital period would be worth consideration.

51st. (Highland) Division.

22. Communications in 51st (Highland) Division appear in general to have been satisfactory. The success during the assault was attributed very largely to exercises carried out on the lines of the operation. These exercises were on a progressive basis with the next higher formation always represented. From these exercises many lessons were learnt of which full advantage was taken.

23. Planning started in MAY. An outline signal plan was produced based on the actual operation, the numbers and types of craft and the distances involved. A joint memorandum on communications (in a shore to shore operation) had been produced by Headquarters Force 141 in MARCH. This proved invaluable as a basis for planning and training. The lack however of any R.A.F. signal representative during the planning stage is worthy of comment.

24. The main differences between the signal plan and the communications set out in Combined Operations Pamphlet were:-

(a) Owing to the nature of the landing an enlarged Beach Signal Unit was required.

(b) The number of Major Landing Craft involved necessitated two naval landing waves being used. In spite of this the operation showed that these nets were very much too large.

(c) Each Naval Advance Party was increased by one No.18 set and one man, to enable this party to keep watch on the two

landing waves.

(d) No forward Air Controls were employed since it had been agreed that all Air Forces should be controlled at Army Level.

(e) An L.C.I.(L) was used as a Bde. H.Q. Ship

25. Netting of groups was carried out a fortnight before the operation took place. The great care with which this was done must partly account for the fact that no difficulty was experienced in establishing communications on Army Nets once silence was broken.

26. During the voyage W/T silence was kept, inter ship and craft signalling being carried out by V/S, of which there was very little. Listening watch was opened on all nets at H-1 hours.

27. Wireless silence was broken on all nets at H hour. Communication on the L.C.I.(L) which contained Brigade Headquarters was established on most nets soon after this, the main exception being failure on landing waves. These failures were considered to be due to the following causes:-

(a) Unsatisfactory equipment in the L.C.I.(L) and in other Major Landing Craft.

(b) Insufficient training of landing wave operators.

(c) Failure to realise that up to the time of landing of Bde. H.Q. all control of craft carrying the assault Brigade should have taken place from the L.C.I.(L), and not from S.N.O.L. ship.

(d) No Naval Signal Officer present on the L.C.I.(L).

28. Points noted.

(a) The importance of Naval landing waves in the early stages. The non working of these waves resulted in the Brigade Commander being unable to locate certain of his serials, and with heavy opposition this might well have affected the course of the battle.

(b) The No.46 set is the only suitable set for use on large nets with the present standard of training of landing craft signal ratings.

(c) The success of an L.C.I. fitted as a Bde. H.Q. ship.

(d) The need for a vehicle in the Beach Signal Section Unit. Its chief use would be in landing maintenance party stores, line laying and the transferring of sets and personnel rapidly between beaches.

(e) Some line and "Walky-Talky" wireless sets in the beach signals would be of value. The latter besides their use on the beaches and maintenance area would provide communication across the sea gap between beached L.S.Ts. and the shore.

(f) The need for a second Army and Naval beach Signal Officer in the beach Signal Unit to deal with a reorganisation as occurred in the 51 (Highland) Division assault (see para. 24 (a) above).

(g) The possibility of allowing wireless silence to be broken a short time before Zero hour. Nets can then be working

by Zero hour which will give increased confidence to staffs and signals.

(h) Pyrotechnic success signals are too easily confused with enemy signals and it is difficult to tell from the sea from which beach they come. It is suggested that coloured flares, on the lines of a port fire, should be burnt at ground level.

LANDING SHIPS AND CRAFT

29. Landing Ships and Craft used during this operation included several types whose limitations and capabilities were virtually unknown to some of their users for example L.C.T.(R), L.C.G., L.C.I. and L.S.T. This was in part due to the lack of exchange of technical information between theatres, which suggests that a high priority should be given to this in the future.

30. Above all this operation showed the immense value of the DUKW and the ability of minor landing craft to operate under bad weather conditions. A strong wind blew from H-14 to H-4, reaching force 6-7 at H-10. At H force was still 4-5. In spite of this the assault was not delayed with the exception of L.C.Ts which were two to three hours late.

31. Seasickness was very prevalent. To overcome this every effort should be made to make troops as comfortable as possible, including the issue of paper bags. It was found that troops who had been acclimatised by living on board for several weeks were comparatively immune. A seasick cure has now been approved. It should assist in overcoming this difficulty to a certain extent.

32. Points noted

(a) L.C.A.

When troops are carrying large packs and full battle equipment and with the addition of stores in the craft it is better for the two outside sections to sit sideways on the seats instead of astride them. In this way more troops can be accommodated and with greater comfort.

(b) L.C.I.(L).

The craft are not assault craft. They ground in too deep water, and appear to catch fire easily when hit, under which conditions they are death traps. The brows have too steep an angle of descent and are too slippery for quick disembarkation of men in hobnailed boots. The first man off each ramp should be a sailor stripped to swim who takes a line in and secures it ashore. This gives the loaded soldier something to hang onto if he loses his feet; it also enables the depth between ramp and shore to be ascertained. If possible troops should be given bunks instead of seats which would do much to lessen seasickness.

(c) L.C.T.(R)

An examination of one beach on which firing took place showed good fragmentation from which one can assume good blast effect. The depth of crater in this case on hard stony soil was six inches. The noise of explosions of salvoes was terrific and the morale effect of this craft, quite apart from the material, very great. All reports have nothing but praise. Some rockets landed very close to some Italian mines but did not detonate them.

(d) L.C.P.

Although no operational use was made of them a few are invaluable during an operation for use as water taxis for officers and messengers going ashore.

(e) L.C.G.(L)

These craft were used on several occasions. Reports differ as to their efficiency. One indicates that craft were slow in engaging targets with the result that destroyers closing the beach had engaged the targets before the L.C.G.(L) were in action. Another considers direct fire satisfactory but that signals between craft need improving for controlling indirect fire. It seems however apparent that faults were largely due to lack of experience and training.

(f) L.C.T.

Modifications are necessary before L.C.T. can carry scorpions. L.C.T.VI, with unloading ramps at both ends would have been a great asset for helping to bridge the water gap, in this operation where there was no tide, and no current off-shore.

(g) Store Ships

Holds used for petrol should be lined with bullet proof plastic or if this is not possible with a wall two sand-bags thick.

(h) L.S.I.

Red lights should be fitted in all assembly points and at gangways to accustom eyes to the darkness. Blue lights do not have this effect.

Personnel should embark by units but should be accommodated by landing serials.

(i) All minor landing craft should have a small red mark buoy attached which will float clear if the craft is sunk, and mark its position in shallow water.

DUKWs.

33. This amphibian proved itself to be of immense value, enabling stores and equipment far exceeding the quantity expected to be handled over the beaches.

34. The following points regarding their use should be borne in mind:-

(a) DUKWs were overloaded which resulted in some sinking. To avoid this standard loads should be laid down and an officer should be appointed on each ship to control the load. The load should not exceed three tons.

(b) Ships being unloaded should be inshore as close as possible thereby reducing the turn round. Their position along the shore line should be as near as possible to the beach landing point. Each mile of unnecessary water travel is three hundred pounds of material lost for that trip.

(c) One DUKW should be loaded with one type of store only if time is not to be wasted in unloading at depots.

(d) DUKWs working from landing craft require two drivers plus two crew, and from M.T. store ships two drivers plus four crew. This will allow 100% relief.

(e) Due to lack of proper rigging of guest warps and spring line and mooring hooks with hand lines on ships being unloaded, the efficiency of DUKWs alongside was handicapped. To correct this a rigging crew from each DUKW might go aboard and rig the ship before unloading is begun. The crew should have the necessary lines and hooks with them.

(f) If L.C.T. are to carry stores and unload to DUKWs while still afloat, methods should be developed so that DUKWs can be loaded overside L.C.T. as well as by the ramp in order to save unloading time. Such L.C.T. might be fitted with power operated derricks, one port, another starboard.

(g) The use of cargo nets with base plates shaped to fit the DUKWs hold might be exploited.

(h) DUKWs should not be used for long runs inland.

(i) A percentage should be fitted with 'A' frames.

35. The DUKW might well be used for the early landing of supporting arms. At present reliance is placed on the L.C.T. During this operation L.C.T. were frequently delayed in beaching, which resulted in lack of support for the initial landing. In this respect the use of 16 DUKWs by the Americans on D day to D + 2 day for unloading artillery up to and including 105 mm proved most successful, artillery being got ashore and ready to fire very quickly.

Royal Engineers.

36. Owing to the weakness of the defences, the Royal Engineers were not as busy as expected.

37. Points noted in connection with equipment are contained in para. 19. Other points are:-

(a) A thorough and early reconnaissance of the Beach Maintenance area for mines and booby traps, and for road work in the depot areas, is essential. Until this has been done the key plan cannot become firm, with the result that time may be wasted at a later stage.

(b) Further training in handling bulldozers at night is required.

(c) The extent to which water can be pumped from L.S.Ts. to 'S' tanks in tidal waters should be investigated.

(d) The limitations of "skeletonised Summerfeld" should be determined.

(e) The best method of using bulldozers with explosives for removing rocks should be investigated.

MEDICAL.

38. Further research is required for the prevention of seasickness.

39/.....

39. Hospital ships should carry craft fitted to take stretcher cases and which can be hoisted inboard fully laden.

40. R.N. personnel who are going to be ashore require training in hygiene and how to live ashore.

41. Transport aircraft were most useful for evacuating casualties, thus reducing numbers of medical personnel required ashore.

SECURITY.

42. Two aspects of security which merit particular attention are:-

(a) The need for sealed areas in which mounting and briefing can take place. This is an important requirement when briefing troops, issuing them with maps and photographs if security is not to be risked.

(b) The necessity for detailed orders and instructions regarding the issue of maps in bulk and the breaking of bulk for distribution to the users.

ANNEXURE 'A'

Rules laid down by Force Commanders for adoption in the plan for the landing of Regimental Combat Teams of the U.S. 3rd Division.

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1. Each Regimental Combat Team should train one battalion as a "Beach Assault Battalion". Their primary task initially would be the destruction, or at least engagement, of beach defences, so that the second, and third battalions could bypass resistance and penetrate inland. These battalions were trained to operate until daylight in the parties in which they were put ashore (i.e. boat parties of 35 men including engineers).

2. All beach Assault Battalions would land simultaneously at H hour, preceded by a wave of LCS firing grapnels, the second battalion would land at H plus 45 minutes, and the third at H plus 60. RCTs would retain NO floating reserve.

3. Each Beach Assault Battalion would take passage in 6 LST, each of which hoisted 5 LCV and 1 LCS. Each Beach Assault Battalion would take ashore one Force Commander's personal Liaison officer equipped with a jeep and a SC 193 wireless set.

4. The Regimental Commander would land personally with the second or third battalions and would take passage in the Headquarters LCI which was specially fitted for that purpose.

5. Shore and Beach Group reconnaissance parties would be landed partly with Assault and partly with follow-up battalions.

6. The first wave of LCTs would beach at H plus 90 (with one particular exception), and would carry mainly Beach Group personnel and vehicles and two Light AA batteries (S.P. guns only) in 7 LCT. 5 more LCT would carry a company of medium tanks towing 57 mm A/Tank guns and followed by the latter's prime movers. All LCT carrying tanks were to be loaded so that as many tanks as possible could fire on to the beach during the final approach.

7. The composition and timing of subsequent LCT waves was similarly laid down by Force Headquarters.

8. Except in particular cases which had to be referred to the Joint Force Commanders, all landing craft would approach the beach in their normal formations of either 6, 12 or 18 craft. (This rule was fairly often infringed.)

9. No wheeled vehicles, except certain specified communications and artillery jeeps, would be landed until the Beach Group personnel and equipment, carried in the first LCT wave, had been ashore for a clear two hours, to allow time for the laying of beach roadway.

10. The first artillery units ashore on each beach would be a battalion of the Divisional Artillery equipped with SP guns (12 guns) on a very reduced scale of transport, carried complete with personnel in 4 LCT, timed to beach two hours after the Shore Groups. Artillery reconnaissance parties would be carried in earlier waves.

11. All units were to be tactically loaded with not more than one battery of guns, or one company of tanks (etc.) in any one ship or craft.

A N N E X U R E "B".

PLANNING BY U.S. 3rd DIVISION.

(a) Planners should be divorced from all other duties in connection with training and mounting the operation until such time as the Landing and Loading tables are firm. To enable this to be done, staffs should be augmented for the planning period, and the increase should come, as far as possible, from within the formation concerned.

(b) Landing and Loading tables should be prepared simultaneously and graphically from the start of planning.

(c) Army planning would be simplified if ships and craft could be given serial numbers indicative of their role, beach and wave in the Landing Table. At present one set of serial numbers is used during the early stages of planning which is then altered to the serial numbers of the craft allotted for the operation. These numbers should be painted on the actual ships and craft - when finally sub-allotted - for the period of the operation.

(d) A preliminary Appreciation made by a P.M.L.O. and a naval staff officer, both of whom should be primarily "experts" in the technicalities of amphibious assaults, is an essential preliminary to the Force Commander's final appreciation and selection of a Plan.

(e) One of the most important roles of the P.M.L.O. is that of adviser on assault technique in the very earliest phases of planning. Primarily he should be a tactical or "G" staff officer and not a "Q" expert. The "Q" movements duties which a P.M.L.O. is sometimes expected to perform could be better undertaken by the ordinary "Q" staff augmented by a Grade II or Grade III "Q" movements specialist.

(f) Air planners should be appointed to participate in joint planning from the very start, down to the level of sub-Task Force or Divisional Headquarters. The lack of air representation during planning was keenly felt both in this and the PANTELLARIAN operation, a necessity which even now does not appear to have been recognised in view of the continued absence of air representatives during the SALERNO planning.

(g) 36-inch air photographic coverage of the entire coastline to be assaulted should be provided with initial intelligence. This is required as much for its topographical information as for its disclosure of prepared defences.

(h) An air photograph interpreter is an essential member of a planning team.

(i) The complete period of planning for a Division employed in a shore-to-shore assault, from the time when the Commanders are first confronted with the Corps or Army Outline Plan, and with full intelligence and photographs, up to the final production of Landing Tables, Loading Tables and Loading diagrams, could well be reduced, in emergency to 16 days.

ANNEXURE "C".

STORES HANDLED ON BEACHES.

1. OVERALL FIGURES.

(a) Eight Army D to D + 17 (inclusive) over beaches - 56,747 tons.

6 Beach Groups were working during this period, and one extra for the first four days. This gives an overall average of about 500 tons per Beach Group per day.

(b) Seventh Army D to D + 14 (inclusive) - 79,531 tons.

This includes stores handled through ports.

(c) Three Beach Groups (M.E.)working on beaches between CASSIBILE and AVOLA by midday D + 27 had landed 40,163 tons of stores, an overall average of 500 tons per Beach Group per day.

2. TWO ENGINEER SHORE BATTALIONS WITH ONE ADDITIONAL BATTALION D TO D + 1. WORKING ON 1ST U.S. DIVISION BEACHES AT GELA.

DAY	STORES (TONS)	PERSONNEL.	VEHICLES	DUKWs in SERVICE.
D	1,200	21,204	1,000	128
D + 1	3,000	9,041	1,000	119
D + 2	1,351	428	458	164
D + 3	924	2,174	457	174
D + 4	1,096	1,844	116	174
D + 5	2,288	5,030	216	173
D + 6	2,558	196	602	173
D + 7	2,927	122	666	166
D + 8	3,026	1,817	457	206
D + 9	2,528	1,258	284	204
D + 10	2,756	1,047	296	203
D + 11	2,488	5	93	203
D + 12	2,506	-	10	204

P.T.O.

3. TWO BEACH GROUPS (U.K.) WITH 120 DUKWs. WORKING ON 1st.CANADIAN DIVISION BEACHES 56 & 57, SOUTH & SOUTH WEST OF PACHINO.

DAY	STORES(TONS)	PERSONNEL	VEHICLES
D	-	7,068	90
D + 1	-	500	250
D + 2	-	640	320
D + 3	150	9,020	260
D + 4	1,014	-	340
D + 5	1,485	-	339
D + 6	1,638	-	201
D + 7	2,220	-	91
D + 8	2,752	-	50
D + 9	2,805	-	386
D + 10	4,049	950	352
D + 11	4,376	290	153
D + 12	2,638	-	-
D + 13	1,782	-	-

4. NOTES:

(a) Rates of discharge varied with the arrival of convoys; on some days little work could be done as earlier convoys had been cleared ahead of programme.

(b) On most of the beaches referred to in paras. 1(c) and 3 up to 700 Italian prisoners per beach were helping.

(c) Hold-ups sometimes occurred through insufficient labour in the depot areas to unload DUKWs.

(d) Tonnage figures given in para. 2 were based on 2½ tons per truck or DUKW load as they passed the checker station.

(e) Beach 57 referred to in para. 3 was used for unloading all stores until D + 3. This beach was found to be unsatisfactory and from D + 4 stores were unloaded on beach 56.

A N N E X U R E 'D'

Sketch of Pontoon Dock

L.S.T. or L.C.T. Berths