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A N N E X E A S Y

TO

FOURTH

MARINE DIVISION

OPERATIONS REPORT

IWO JIMA

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COMMUNICATIONS

PART I - PRE-EMBARKATION

1. PLANNING

(a) Overall plans for the operation were announced in sufficient time to permit the formulation of a comprehensive and well integrated communication plan. Tentative communication plans of higher echelons were issued at an early date, making possible a series of conferences between the Attack Force Communication Officer, the Landing Force Signal Officer, and the several Division Signal Officers. These conferences served to eliminate most of the potential sources of trouble.

(b) In a few instances the communication plans of higher echelons were inadequate from the standpoint of Divisions and lower units. This Division was assigned insufficient voice calls and was obliged to make up the deficiency from the call list of another Division not participating in the operation. As it is now customary in radio dispatches and telephone conversations to refer to units by their voice radio calls rather than their actual names, each Division should be assigned sufficient voice calls to permit the assignment of a call to each organic or attached unit. A total of fifty voice calls per Division are required for this purpose. The number of CW calls required is considerably less, as CW calls are required only for those units which are equipped with CW radios. Twenty-five CW calls per Division should be sufficient.

(c) Instructions in CentComTwo relative to the crypto-aids to be landed by each Division were not explicit. This uncertainty was not eliminated by the Landing Force Operation Order.

(d) Air raid warning and anti-aircraft control instructions contained in the Joint Expeditionary Force Operation Order and in the Landing Force Operation Order caused some confusion in this Division, in spite of repeated efforts to clarify the matter. The Landing Force could completely eliminate the present uncertainty and confusion by announcing the effective air raid warning and anti-aircraft control conditions over the regular Landing Force wire and radio circuits, thereby relieving Divisions of the necessity of monitoring the Local Air Warning Net.

(e) Plans for using the shackle cipher as a means of authentication did not crystallize until after the Hawaiian rehearsal. Prior to that time, three widely differing sets of instructions for shackle authentication had been promulgated, and much

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confusion had resulted, as attested by the large number of Hawaiian rehearsal messages which were incorrectly authenticated. Profiting by this experience, the Landing Force abandoned the message authenticator system and standardized a simple system of station authentication which was already in use in both the 4th and 5th Marine Divisions. This system of station authentication proved very satisfactory in the ensuing operation.

(f) Last minute changes in the shackle cipher itself resulted in considerable waste of time and scarce materials. This Division had just completed the printing and distribution of some 36,000 shackle grids based on alphabets listed in the Landing Force Rehearsal Order when a new series was substituted, necessitating a complete re-printing and redistribution. It is believed that Landing Force could eliminate such difficulties and give considerable assistance to Divisions and lower echelons by assuming the responsibility for printing and distributing all shackle grids.

(g) The communication plan of this Division was embodied in the following documents issued prior to the operation:

- 4th Mar Div SIGSOP-3.
- 4th Mar Div SOI-6.
- 4th Mar Div Communication Guide for Commanders and Staff Officers.
- Annex How to 4th Mar Div Opn Plan No. 49-44.
- Annex How to 4th Mar Div Rehearsal Plan No. 2-44.
- Annex Charlie to 4th Mar Div Training Order No. 2-45.

(h) Owing to changes in plans of higher echelons, numerous changes were required in several of the above documents. In the case of SOI-6, a total of ten changes were issued, an excessive number in view of the difficulty in disseminating such changes, particularly after embarkation. It is hoped that an earlier crystallization of plans will be possible in future operations, in order to materially reduce the number of changes required.

2. ORGANIZATION

(a) The following communication units were attached to this Division for the IWO JIMA Operation, either for the performance of some special function or for the general reinforcement of the communication personnel of the Division:

- 1st Joint Assault Signal Company (JASCO).
- Detachment 726th Signal Air Warning Company (726th SAW Det).

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Detachment V Amphibious Corps Signal Battalion
(VAC Sig Det).
V Amphibious Corps Liaison Team (VAC Ln Team).

(b) An Air Liaison Party was assigned to each Landing Team, each Combat Team, and Division Headquarters. The battalion and regimental parties were each augmented for the operation by the addition of three enlisted, while the Division Headquarters party was increased by two officers and ten enlisted. These additions were necessitated by the operational requirements imposed by higher authority. The present T/O allowances are entirely inadequate to meet these requirements.

(c) Shore Fire Control and Naval Gunfire Liaison Parties were organized and assigned to Landing Teams, Combat Teams, and Division Headquarters in accordance with FMF Pac Special Order No. 86-44, which materially augmented the hopelessly inadequate T/O allowances.

(d) Nine Shore Party Communication Teams were organized from the Shore Party Section of the JASCO, one at T/O strength for each of the four Shore Parties of each assault Combat Team, and a somewhat larger team, comprising 2 officers and 19 enlisted, for the Division Shore Party. The duties of Shore Party Communication Officer were performed by the JASCO Commanding Officer.

(e) Administrative control of the various elements of the JASCO remained with the JASCO Commanding Officer.

(f) The 726th SAW Det, comprising 1 officer and 34 enlisted, and the VAC Ln Team, comprising 1 officer and 5 enlisted, were placed under operational control of the Division Signal Company. The VAC Sig Det, comprising 1 officer and 45 enlisted, was attached to the Division Signal Company.

(g) Replacement communication personnel accompanied the Division in the 24th and 30th Replacement Drafts. In accordance with orders from higher authority, these replacement personnel were not available for transfer to communication units of the Division until actually required as casualty replacements. This arrangement proved disadvantageous, for reasons which will be brought out later.

(h) At embarkation, the communication personnel strength of the Division was 26 below the authorized "T/O plus 5 percent". This strength was augmented for the operation by the addition of the 45 enlisted personnel of the VAC Sig Det and the 74 enlisted personnel of the 24th and 30th Replacement Dra

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3. TRAINING

(a) Training for the next operation was begun immediately on return from the TINIAN operation. Training programs were conducted by all organizations, commencing with basic re-training and ending with several Division CPX's in which all units participated.

(b) As a large influx of new types of radio equipment had begun, special efforts were made to train technicians in the adjustment and repair of these sets. Maximum advantage was taken of the skill and facilities of the Division Signal Repair Section to train regimental and battalion repairmen. This training resulted not only in improved standards of maintenance in lower echelons, but created a closer liaison between the higher and lower echelons of repair.

(c) Advantage was also taken of the training facilities offered by the FM school conducted by FMF Pac. Selected personnel from all units were sent to this school with profitable results. It is hoped that this school will be available for additional training in the future, and that the school will be expanded to provide instruction in each new type of equipment as it is introduced to the Pacific theater.

(d) Special emphasis was also devoted to training in radio countermeasures. A representative of the Signal Officer's Section, FMF Pac, conducted a school in this subject for all radio operators of the Division. Although the course was of short duration and came too late in the training cycle for maximum effectiveness, the results were very good, and it is hoped that this type of training will be extended and intensified.

(e) Unfortunately, most of the replacements for the casualties suffered in the SAIPAN and TINIAN operations did not reach the Division until the training period was nearly over. As a consequence it was impossible, in the time available, to bring these replacements to the high state of training achieved by personnel who had completed the entire training program. Many of the replacements were ex-radar personnel with no experience in communications. These personnel were developed into passable voice radio operators in the time available, but will require a great deal of additional training before they can be assigned to other tasks.

(f) Communication personnel of the 24th and 30th Replacement Drafts did not arrive in time for adequate training, nor were they available for assignment to communication units where training could be most effectively and expeditiously carried out. Many of these replacements had had no experience in combat units, and were

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unfamiliar with much of the communication equipment in common use. This was particularly unfortunate in the case of non-commissioned officers who should have been ready to fill key positions in a Communication Platoon or Section. A few signal repairmen had had no experience in repairing the various types of radio equipment used by the Division, and in some cases had not even seen some of the equipment prior to joining the Division. There was not sufficient time to familiarize these men with this equipment prior to embarkation.

(g) Communication personnel of the Naval Gunfire and Air Liaison Parties were not as well trained as other communication personnel in the technique of communications. This deficiency does not reflect on the diligence of JASCO officers. It stems from an inherent defect in the JASCO structure. The officers assigned to Naval Gunfire and Air Liaison Parties are not communication officers, nor are they qualified to instruct their personnel in the technique of communications. This places the burden of instructing well over a hundred communication personnel in these teams on the shoulders of the two qualified communication officers in JASCO Headquarters. As these officers already have full-time executive and administrative duties it is a credit to them that the training reached as high a standard as it did. The situation was frequently aggravated by prolonged official absences of officers in charge of teams, and by last minute replacements of skilled officers with officers of no training or experience whatsoever.

4. EQUIPMENT

(a) The Division embarked for IWO JIMA in a generally excellent state of material readiness. The few shortages which remained had no serious effect on the ensuing operation.

(b) Excess equipment which the Division had on hand was utilized in two ways. In some instances the excess was placed directly in the hands of the using units to meet operational needs not provided for by the tables of allowances. In the remaining instances the excess was maintained on hand as an emergency pool. It was anticipated that difficulty would be experienced in establishing signal repair facilities on the exposed IWO beaches during the first few days of the operation, and that a considerable amount of damaged equipment would have to be replaced outright, pending eventual repair. The emergency pool was set up to meet this situation should it occur.

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PART II - EMBARKATION

1. DIVISION HEADQUARTERS COMMUNICATION PERSONNEL AND EQUIPMENT

(a) Communication personnel serving Division Headquarters were divided into three main groups. The largest group, comprising 12 officers and 200 enlisted, was embarked aboard the USS BAYFIELD, carrying the Commanding General. This group was of sufficient size to man a complete command post communication installation on a continuous basis, or to man for a limited period a complete command post installation plus a forward or rear echelon installation. This group relied upon installed shipboard communication equipment for communication afloat, and carried sufficient portable equipment, reinforced by hold-loaded vehicles, for communication ashore. Approximately 50% of the portable signal equipment and 25% of the signal vehicles were embarked on this ship. The Division Signal Officer, Signal Company Commander, JASCO Commander, Division Air Liaison Officer, and Division Naval Gunfire Liaison Officer were included in the group aboard the BAYFIELD.

(b) The second main group, comprising 9 officers and 134 enlisted, was embarked on board the USS MELLETTE, carrying the Assistant Division Commander. This group was of sufficient size to enable the ADC to take over the control of the Division, afloat or ashore, should the need arise. This group also relied upon installed shipboard facilities for communications afloat, and carried sufficient portable equipment, reinforced by hold-loaded vehicles, for communications ashore. Approximately 30% of the portable signal equipment and 25% of the signal vehicles were loaded aboard this ship. The signal group on the MELLETTE functioned under the Assistant Division Signal Officer.

(c) The third main group, comprising 2 officers and 52 enlisted, was embarked aboard LSM 260. This group consisted of the drivers necessary to man the 27 embarked vehicles, plus the operating portion of the 726th SAW Det and a small group of wiremen. This method of transporting some 50% of the signal vehicles, plus 20% of the portable signal gear (pre-loaded in vehicles) was an innovation which proved outstandingly successful, as it enabled this equipment to be landed expeditiously and without loss in spite of sea and beach conditions which were causing heavy losses to small boats and their cargos.

2. DIVISION SIGNAL SUPPLIES

(a) Signal replenishment supplies were divided equally

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between two cargo ships, with a Signal Company officer aboard each to insure proper care in transit, to supervise selective unloading, and to assist in delivery to the beach.

3. SIGNAL COMPANY OPERATIONS DURING EMBARKATION

(a) During the embarkation period the Signal Company provided telephone, teletype, and messenger service between the dock area and the camp. An advance message center was established aboard the BAYFIELD prior to the embarkation of Division Headquarters, permitting the movement of the Division Command Post without interruption of communication.

PART III - MOVEMENT TO TARGET

1. SIGNAL COMPANY OPERATIONS ABOARD SHIP

(a) Throughout the entire voyage, continuous effort was devoted to perfecting the tactical communication set-ups aboard the BAYFIELD and MELLETTE. The final forms of these set-ups are illustrated in Appendices 1 and 2. The elaborate set-up aboard the BAYFIELD is the most effective transport communication installation ever employed by this Division. The success of this installation, in which 18 transmitters and 25 receivers were operated simultaneously and continuously for the first five days of the operation, was largely due to the boundless cooperation and untiring energy of the Communication Officer of the BAYFIELD. In the initial establishment of the communication set-up, this officer conducted exhaustive tests and devised a wide variety of technical expedients which made the simultaneous operation of so many equipments possible. In the ensuing operation the ship's communication crew were indefatigable in locating and remedying troubles and preventing serious interference with communications.

(b) In addition to establishing, testing, and exercising the tactical communication set-ups, the Signal Company provided administrative telephone and messenger service, and assisted the ships' communication forces by copying press, manning naval radio circuits, and standing communication office and coding room watches. The ships, on the other hand, provided the message centers with copies of all ship traffic. The Transport Squadron Flag Office provided guard mail service.

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2. EQUIPMENT INSPECTIONS

(a) Frequent inspections of signal gear were made during the voyage, particular attention being paid to storage batteries. Ship's battery charging facilities were used when necessary.

3. TRAINING ABOARD SHIP

(a) Training of communication personnel was continuous throughout the voyage. All personnel were briefed on tactical plans for the operation, and regular schools were conducted in message center procedure, radio procedure, and communication plans. All personnel participated in daily physical exercises.

4. REHEARSALS

(a) Rehearsals for the operation were conducted in the Hawaiian area and again in the forward staging area. The rehearsal in the Hawaiian area, involving naval gunfire and the actual landing of troops, afforded a reasonably complete check on communication plans and facilities. As beach conditions prevented the landing of LSM 260, portable signal equipment was used extensively at the Division Command Post ashore. This did not detract from the value of the rehearsal, as it was very likely that conditions at IWO might necessitate similar arrangements.

(b) Several instances of radio interference were encountered in the Hawaiian rehearsal which necessitated frequency reassignments.

(c) Many difficulties inherent in the shackle system of message authentication became apparent in the Hawaiian rehearsal. As a consequence, the message authentication system was abandoned by the Landing Force in favor of a simple system of station authentication already in use in the 4th and 5th Marine Divisions. The latter system proved highly satisfactory in the ensuing operation.

(d) As the rehearsal in the forward staging area did not involve the landing of troops, it provided an incomplete check on troop communications.

(e) In neither rehearsal were casualties assessed against communication personnel or equipment. As a consequence the plans for resupply of equipment and personnel were not exercised. This could have had serious results, as the problems of resupply of communication equipment and personnel, while satisfactorily solved in the ensuing operation, were the most pressing problems which arose.

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PART IV - THE ASSAULT

1. OPERATION - GENERAL

(a) Communications in the assault were uniformly excellent. Not a single instance was reported in which a major unit lacked rapid and reliable communication with its superior, subordinate, or adjacent units.

2. OPERATION - MOVEMENT OF DIVISION COMMAND POST ASHORE

(a) A Division Advance Message Center was dispatched to the beach on the afternoon of D plus 3, and by nightfall a complete communication set-up had been established in preparation for the movement of the Division Command Post ashore. This movement took place on the following morning without interruption of communications. In view of the conditions which prevailed on the beach during the first three days of the operation, it is believed that the decision to retain the Division Command Post aboard ship until reasonably complete communication facilities could be established ashore contributed immeasurably to the full and uninterrupted control which the Commanding General was able to exercise during the crucial early stages of the operation.

3. OPERATION - RADIO

(a) A complete description of 4th Marine Division radio channels is contained in SOI-6. The net structure and assignment of frequencies proved sound, and no basic changes are contemplated for future operations. The effectiveness of the radio plan is attested by the fact that during the first four days of the assault, Division Headquarters remained aboard ship and relied almost exclusively on radio communication for control of subordinate elements. No communication failures of more than momentary duration occurred during this period.

(b) In a few instances radio circuits afloat were overloaded by the transmission of long encrypted dispatches or the transmission of long messages by Navajo talkers. These instances emphasized the need for radio teletype and voice scrambling equipment between Division and Corps, and voice scrambling equipment between Division and Regiment. The present means for handling encrypted radio dispatches are still too cumbersome and slow to handle such lengthy traffic as operation orders, dispatch summaries, and periodic reports. There are certain periods in every operation when such material must be handled by radio. With present

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devices these messages are a constant threat to communications.

(c) In expectation of beach conditions which would prevent the operation of TBX's during the initial phase of the assault, Shore Fire Control Parties were equipped with SCR-300's and were assigned SCR-300 channels on which to relay spotting information from the spotter to some location, ashore or afloat, where the TBX could be operated. As further insurance, each party was equipped with two SCR-536's tuned to its assigned shore fire control frequency. Both expedients proved necessary and effective.

(d) Owing to lack of equipment and personnel in Air Liaison Parties, the task of operating ground stations in the Support Air Observation Net was assigned to the Signal Company and to the Communication Platoons of Regiments and Battalions. This expedient was not completely satisfactory as the Signal Company and Communication Platoons are not provided with personnel and equipment for this purpose either, although they are somewhat better off than the Air Liaison Parties. In the future it is hoped that Air Liaison Parties will be provided with additional personnel and equipment so that all air-ground communications may be assigned to the JASCO.

(e) Crystal control of radios was widely used. Wherever possible at least one crystal controlled transmitter was employed on each net to accurately establish the net frequency. The crystal grinding shop of the 6th Base Depot filled all orders expeditiously in spite of the fact that it had just commenced operation and was hard pressed at times for materials with which to work.

(f) A normal amount of atmospheric noise was encountered in the operation. It caused no serious difficulty.

(g) Interference between friendly stations was reported in a number of instances, particularly in the case of the SCR-300. It was eliminated in every case by a judicious re-assignment of channels. The probability of this interference was enhanced somewhat by the failure of higher authority to space channels to the maximum extent within each Division. This Division, for example, was assigned SCR-300 channels 38, 39, and 40.

(h) The fourteen SCR-300 channels assigned to this Division for the operation were barely sufficient. In an operation involving a larger number of Divisions, communication in lower echelons would be seriously impaired by lack of SCR-300 channels. A set similar to the SCR-300 but operating on frequencies from 48 to at least 60 megacycles is urgently needed.

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(i) Severe harmonic interference was received on several FM channels between 20 and 40 megacycles. This interference was generated by destroyer transmitters engaged in shore fire control communications, and was apparently occasioned by the use of excessive power together with improper antenna coupling.

(j) The radio installation aboard the BAYFIELD, by virtue of the large number of transmitters and receivers in close proximity, required considerable study and labor to reduce mutual interference to a workable level. The goal was finally achieved by extensive grounding and shielding of equipment, by judicious choice of antenna type and location, by use of coaxial antenna lead-ins, by use of minimum power and careful transmitter adjustment, and by proper assignment of equipment to each channel.

(k) Severe radar interference was encountered aboard the BAYFIELD whenever the SC-3 radar was in operation. Fortunately this radar was used only during red alerts. Each time the radar beam swept across the receiver antennas an extremely loud 60 cycle note made reception impossible. On shore, a 400 cycle note was picked up by all receivers within 150 yards of the AN/TPS-1 radar. This interference did not seriously interfere with reception, and beyond 150 yards no interference was noticeable.

(l) A number of enemy transmissions were reported on frequencies assigned to this Division. In most instances this interference appeared to be unintentional, and the transmissions were of short duration. At certain periods of the night, strong enemy signals were received from the Empire, but in no instances were these interpreted as jamming efforts.

(m) On one occasion the enemy made obvious attempts to interfere with the operation of the 4th Marine Division Reconnaissance Net. His efforts included both jamming (CW or 500 cycle audio tone) and deception (orders to secure net, assumption of friendly calls). As the enemy station failed to authenticate when challenged, his deceptive transmissions were disregarded. When the interference became intolerable, friendly stations shifted to another frequency, while two dummy stations continued to send operating signals on the jammed frequency. The enemy station remained on the old frequency for some time, but finally ceased transmitting and did not interfere with this net again.

(n) A few attempts were made, with the help of Division language officers, to intercept such enemy radio transmissions as were reported to Division Headquarters. The delay in reporting these transmissions, together with the inadequate resources available

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equipment, robbed these attempts of any success. It is believed, however, that much information of immediate tactical value could be secured by the employment of a Radio Intelligence Platoon attached to the Division Signal Company.

4. OPERATION - WIRE

(a) Because of the relatively short distances involved, and the slow movement of the front lines in the face of heavy enemy resistance, the Division wire system was both compact and elaborate. A total of 48 locals and 29 trunks were connected to the Division switchboard. Three trunk lines were laid to each Regiment, laterals were laid between Regiments, important lines were "laddered" against the effects of enemy fire, and all trunks vulnerable to vehicular damage were overheaded. As a result of these precautions wire communication was highly reliable and handled a very heavy traffic load, both tactical and administrative, without difficulty.

(b) In the vicinity of command posts, overheading could not be resorted to for security reasons, and lines were laid on the ground. Because of the cushioning effect of the loose volcanic ash, this wire suffered little damage from foot traffic over a period of nearly a month. Where these lines crossed roads it was necessary to bury them for protection against vehicular traffic.

(c) As in previous amphibious operations, Switchboards BD-71 and BD-72 proved cumbersome, and for the weight of equipment involved did not furnish sufficient drops for battalions and regiments. A light-weight switchboard is badly needed.

(d) Teletype was operated with excellent success between Landing Force and Divisions. This form of communication is ideally suited to handling lengthy messages such as operation orders, dispatch summaries, and periodic reports. Unfortunately the currently authorized teletype equipment is too heavy and bulky for use at regimental command posts. A real need exists for a compact, light-weight teletype or tape facsimile equipment to be used between Division and Regiments.

(e) Telegraph equipment was simplexed on one line between Division and Landing Force, but was not used. No telegraph equipment was installed on lines to lower echelons.

(f) The present T/O allowances of wire personnel are generally adequate. Some re-distribution in rank is desirable in the Signal Company, as there are insufficient wire chiefs in that organization in view of the large number of

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(g) Inasmuch as the wire facilities employed by Shore Fire Control and Naval Gunfire Liaison Parties are elementary in nature and can easily be installed by radio personnel, whereas the duties of radio personnel can be assumed by wire personnel only after considerable training, the substitution of radio operators for all wire personnel in these parties is advisable. Such a substitution would assist in meeting the needs of these parties for more radio operators.

(h) The Artillery Regiment, using a fire-direction telephone system paralleling the tactical system to its battalions, experienced a shortage in wire personnel. Two additional wire teams of four men each are necessary to handle the fire-direction system.

5. OPERATION - MESSAGE CENTER

(a) In spite of a traffic volume heavier than in any previous operation, message centers functioned with increased speed and precision. Between 3 January and 10 March, the Division Message Center alone handled a total of 9,924 messages. This figure does not include a large amount of intercept traffic routed to Division Staff Sections for information.

(b) The various cryptographic devices again proved slow and cumbersome. The Joint Assault Code is not well suited to encoding operation orders and dispatch summaries which constitute a large portion of the traffic requiring encryption. A complete revision of this code, based on a study of operational traffic, might produce a workable code, but a more promising solution to the problem of handling encrypted traffic appears to be in the use of teletype, tape facsimile, and speech scramblers, which provide a sufficient degree of mechanical security without sacrificing speed of transmission. The criticism of the Joint Assault Code applies equally well to the Hagelin Cryptographer and to a lesser extent to Navajo Talkers. Experience in this Division has shown that there are important differences in the vocabularies of Navajos assigned to different major units. As a consequence these units encounter considerable difficulty in communicating with each other by Navajo Talker.

(c) Messenger runs afloat were considerably handicapped by difficulties in obtaining boat service when needed. Inclusion of two DUKW's in the authorized transportation allowance of the Division Signal Company would solve this problem. As an alternative solution the appropriate Navy Operation Plan should specifically assign one or more LCP(L)'s to provide messenger service for the Division Message Center.

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(d) Messenger dogs were used with some success between Division and Regiments. Over the rather short distances involved the speed of these dogs was better than that of a foot messenger and about as good as that of a motor messenger. In a rapidly moving situation, or over extended distances, it is doubtful if the dogs would compare as favorably with foot and motor messengers.

(e) A general increase in the T/O allowance of Division Message Center personnel is required to handle the rapidly increasing traffic load resulting from improved radio and wire communications. In spite of the presence of 10 message center personnel of the VAC Sig Det, Division Message Center personnel were severely pressed to handle the heavy traffic load expeditiously and without error. In an extended operation on a large land mass the shortage of messengers would be acute.

6. OPERATION - MOTOR TRANSPORT

(a) Motor transport personnel of the Signal Company performed an outstanding job in keeping the 51 motor vehicles of the Signal Company in excellent running condition throughout the operation. In spite of the entirely inadequate allowance of motor transport mechanics and supervisory personnel, five major repair jobs and 62 jobs of lesser importance were performed during the operation.

(b) Inasmuch as the vehicles of the air liaison parties can be driven by radio operators, whereas truck drivers can operate radios only after considerable training, the substitution of radio operators for truck drivers in the air liaison parties is advisable, and would assist in meeting the needs of these parties for additional radio operators.

7. OPERATION - AIR WARNING

(a) The 726th SAW Det, operating in the immediate vicinity of the Division Command Post, provided Division Headquarters and the ADC with a continuous and accurate flow of information relative to friendly and enemy air activity. Its AN/TPS-1 radar was the first radar to be set up on the island. The performance of this detachment was outstanding in every respect.

8. EQUIPMENT - RADIO

(a) Due to short distances, favorable terrain, and the slow moving tactical situation, portable radio equipment turned in an excellent performance on IWO JIMA. It is questionable, however, whether the same standard of excellence could be maintained with

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portable equipment at extended distances on a large land mass, particularly in a rapidly moving situation. Under such circumstances it appears likely that the weight of the larger portable sets would seriously limit their utility, while their low power output would be inadequate to cover the distances involved. To meet such conditions it will be necessary to place primary reliance upon vehicular sets such as the SCR-193, SCR-299, SCR-399, SCR-508, SCR-608, and TCS, reserving portable equipment for those instances where terrain conditions or enemy action prevent the use of a vehicular set.

(b) MZ equipment turned in its usual excellent performance. The versatility of this set, based on its ample power output, wide frequency range, adaptability to remote control, and proven reliability, make this set the most generally useful set the Marine Corps has today. The increasing demand for communication at extended distances over all types of terrain makes an increased distribution of these sets imperative. The present TCS remote control equipment should be provided with an integral interphone system, however, as a separate phone line from the set to the remote position is required at present.

(c) SCR-300 equipment performed outstandingly. As this set has insufficient channels for an operation involving more than three divisions, there is an urgent need for a similar set in the frequency band from 48 to at least 60 megacycles.

(d) The IWO JIMA Operation was the first to see a wide distribution and employment of SCR-536's. Performance was very good. The assignment of a frequency to each lettered rifle company appears to be satisfactory. A few BA-38R batteries were tested on the operation and were reported to have an average life of 30 hours. As this is several times the life of the BA-38, the new batteries are an outstanding improvement and will contribute immeasurably to the future success of the SCR-536.

(e) During the course of the operation a few SCR-694 radios were obtained from the Navy and issued to JASCO teams. While the rather narrow frequency range of the SCR-694 limits its general usefulness, its generous power output, relatively light weight, and convenient operating features make it a desirable set for Shore Fire Control Parties.

(f) The M-29 Cargo Carrier was used on an experimental basis as an operating vehicle for both the TCS and SCR-808 radio equipments. Low silhouette, ability to negotiate almost any terrain, plus ease of mounting radio equipment make the M-29 carrier an ideal radio vehicle. As sustained road movement is seldom

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required of Marine Corps radio vehicles, the relatively short road life of the M-29 carrier (as compared with a jeep) is no real disadvantage. The ability of the M-29 carrier to place a powerful radio where it is needed when it is needed should be fully utilized.

(g) TBX-8's were used by this Division for the first time in the IWO JIMA Operation. Some difficulty was experienced in loading up the transmitter at certain frequencies when using the crystal oscillator, a defect which should be eliminated at once. Otherwise the set performed excellently. Operators were generally enthusiastic about the many improvements incorporated in this set. Because of its wider frequency range it is more generally useful than the SCR-694, its closest competitor. A gasoline engine generator, a vehicular power pack, and a quieter hand generator are needed before the full value of the TBX-8 can be realized.

(h) The first samples of Headset MHS-11 and Microphone MT-1 were received along with the TBX-8. In the opinion of all those who have had the opportunity to use the new headset, it is the best headset yet developed for military use. One instance of cord trouble, in the cord joining the two earphones, was reported. Microphone MT-1 is much superior to the T-45 lip microphone, and is an excellent microphone in all respects. The development and production of a hand-holder for the microphone button should be expedited in order to make the MT-1 a universal microphone which could replace all types now in use.

(i) An SCR-399 was drawn by the Division Signal Company in place of the SCR-499 authorized. The SCR-399 is greatly to be preferred, as it includes an HO-17 Shelter. The set is operable on the ground, where it presents a very low silhouette, or on a 2½-ton truck as a vehicular set.

(j) The Division Signal Company had no occasion to use the two MM equipments authorized by the T/A, and these sets remained at the base camp. The same was true of the two SCR-624 radios belonging to the Signal Company. Both types of equipment are unnecessary.

(k) No use was made of the VHF portion of the AN/VRC-1's with which all regimental and battalion Air Liaison Parties were equipped. If these Air Liaison Parties are to continue to be denied the control of air strikes in future operations, as they have been in the past, much would be gained by replacing the AN/VRC-1's with MZ's. The lower silhouette of the MZ offers considerable tactical advantage, while the problem of resupply would be much simplified, as large numbers of MZ equipment are in use throughout the Division, while the AN/VRC-1 is used only in Air Liaison Parties. On the

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other hand, if there is a continuing need for VHF equipment in Air Liaison Parties, a pack VHF set, such as the Army's new AN/TRC-7, should be supplied for use when the vehicular AN/VRC-1 cannot be employed.

(1) A large percentage of failures in the SCR-510 and 610 equipments was occasioned by salt water corrosion of the cable connections.

9. EQUIPMENT - WIRE

(a) The complete absence of trees and vegetation in the area traversed by the majority of Division and Regimental trunk lines necessitated an extensive use of lance poles and 2x4 substitutes for lance poles. Approximately 750 of the latter were used in the operation. As far as materials were available the 2x4's were painted with camouflage paint prior to the operation. This measure, besides reducing their visibility, tended to discourage theft. The 2x4's were cut to lengths of from 18 to 20 feet and proved much superior to the shorter and frailer Lance Pole PO-2.

(b) Two M-29 Cargo Carriers were employed on an experimental basis for wire laying. Each was equipped with two RL-31 reels cut down in height and welded to the rear deck of the carrier. The success of these vehicles exceeded all expectations. Their ability to negotiate any type of terrain, plus their ability to carry a substantial load of wire make them ideal wire laying vehicles.

(c) An experimental quantity of High-Speed Coils of W-130 wire were used on the operation with mixed success. Reports indicate that this method of packaging W-130 is promising, but that several modifications are necessary and should be followed by further tests. The one-mile coil used at present appears too heavy for convenient carrying by assault units. A half or three-quarter mile coil is suggested. A somewhat heavier gauge metal sheath around the coil is also suggested. The present case frequently will not withstand the rough treatment the coil receives in transportation and handling.

(d) Dampness caused the hand generators on several EE-8B telephones to "freeze", necessitating the replacement of the phones.

(e) The issue of only a quarter-mile of W-130 wire on DR-8 drums necessitated breaking open shipping crates and hand winding another quarter-mile to fill the reel. This procedure wasted time, effort, and crating material, both prior to and during the operation.

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10. EQUIPMENT - MESSAGE CENTER

(a) Almost all of the equipment used by Division Message Center was of local construction. This included blackout tents, portable tables and desks, equipment chests, and peg boards showing the operational status of communication facilities.

(b) The standard Command Post Tent was available, but has not been found as satisfactory for Division Message Center use as a specially modified pyramidal tent used by this Division. In fast moving situations on large land masses, suitably equipped HO-17 shelters operable on the ground or in 2 $\frac{1}{2}$ -ton trucks should prove preferable to either.

(c) The MCS-3 Message Center Case is of no use to a Division Message Center. In a message center of this size, portable tables and field desks are indispensable.

(d) The present field message book is entirely inadequate in format size for Division Headquarters use, and the two copies it provides are insufficient for Division Headquarters distribution. At present there are two methods for handling Division Headquarters distribution with the present message book. One method is to prepare the necessary additional copies by hand, three at a time. The alternative is to have a local messenger show a single information copy to all interested parties, standing by while each party reads the message. Both alternatives, by virtue of the time consumed, are entirely unsatisfactory.

(e) The Division Message Center partially solved the problems of message format size and an adequate number of copies by using standard Western Union size message blanks made up into books of four sheets with interleaved carbons. A fully satisfactory solution can be achieved, however, only by the use of a fluid process duplicator capable of rapidly turning out at least fifteen copies of each message.

11. EQUIPMENT - RADAR

(a) The AN/TPS-1 radar employed by the 726th SAW Det proved much superior to its predecessor, the SCR-602. Bogies were picked up without difficulty at 90 miles. Locally modified PE-75 power supplies were used in place of the power unit supplied with the radar, as the small gasoline capacity and high speed of the latter power supply proved very annoying.

(b) The obtaining of meteorological information by

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observation of meteorological balloons was greatly handicapped by frequent low cloud ceilings. An electronic balloon tracking device, such as the SCR-658, would insure the collection of vital data under all weather conditions, and should be issued as standard equipment for the Artillery Regiment.

12. EQUIPMENT - MOTOR TRANSPORT

(a) Repairs on the 51 vehicles of the Signal Company were seriously hampered by lack of sufficient automotive tools. Almost complete reliance had to be placed on tools which were the personal property of the mechanics.

(b) The operation again demonstrated the need for a greasing trailer in the Signal Company. In operations on a large land mass the lack of such a trailer would prove a serious handicap to Signal Company operations.

(c) Experimental use of the M-29 Cargo Carrier as a radio vehicle and a wire laying vehicle has already been touched upon. In general, the mechanical performance of these carriers was excellent. The tracks seem to be somewhat fragile, and considerable track repair and replacement appear likely in an operation at extended distances. Two mechanical failures were reported by the Signal Company during the operation. In one instance a track was thrown when the carrier crossed the remnants of a narrow gauge railroad. Signal Company mechanics, by dint of much hard work, were able to replace and adjust this track without special tools or equipment. In another instance a clutch burned out and was replaced by Signal Company mechanics with a slightly modified clutch from a $\frac{1}{4}$ -ton truck.

(d) No shortage of motor transport was experienced on this operation because of the short distances involved. In an extended operation on a large land mass, additional vehicles for laying wire and moving supplies would be indispensable.

13. EQUIPMENT - LIGHTING

(a) An ER engine generator was used by the Signal Company to supply essential lighting service to the Division Command Post, but proved inadequate in power output. While command post lighting is not the accepted responsibility of the Signal Company, it generally happens that the Signal Company is more favorably located to perform this service than any other unit with the necessary technical knowledge. It is therefore believed that the Signal Company should be equipped with the necessary generators, wiring, and electrical supplies to take over this task. As the Signal Company is

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already equipped with several PE-95's (for powering radio sets), the logical power equipment is the PE-95. This generator has ample power for the job and should be trailer-mounted for convenience in handling.

14. SUPPLY AND REPAIR

(a) The sole threat to communications during the operation arose on D day and was not completely erased until late on D plus 1. A great deal of the signal equipment landed by assault units was destroyed or damaged during this period. As conditions on the beach prevented the establishment of repair facilities, damaged equipment had to be replaced outright by new equipment, pending eventual repair. Surf conditions and shortage of landing craft prevented the immediate landing of these replacements, and the first two LVT loads, one for each assault regiment, could not be landed until D plus 1. Fortunately these loads reached the assault regiments before a critical shortage occurred. On D plus 2 a substantial quantity of replacement equipment was landed, although two LCM loads of signal equipment were lost through sinking. The supply situation was never threatened after D plus 2, as a steady flow of supplies was maintained thereafter. The Division Signal Repair Section was set up ashore on D plus 2 and returned a large proportion of the damaged equipment to service.

(b) The inability to commence signal repair during the early stages of an amphibious operation necessitates a much larger emergency pool of critical signal equipment than now exists. Such a Division pool, augmented at times by a Corps pool, provides the only effective means of tiding the assault units over the difficult period immediately following a landing. A portion of this pool should be pre-loaded in LVT's and held available for dispatching to the beach when the need arises. Normally one such LVT should be dispatched to each assault Regiment on D day or D plus 1. At least one additional LVT should contain the nucleus of the Division Signal Dump, and should be sent to the beach under the personal control of the Division Signal Quartermaster. The remainder of the pool should be loaded on the ships carrying the Signal Officer and the Assistant Signal Officer where it could be loaded into landing craft under the immediate supervision of one of these officers.

(c) Repair operations conducted by the Division Signal Repair Shop are summarized in Appendix 3.

15. PERSONNEL REPLACEMENT

(a) Replacements for communication personnel casualties in the assault units were drawn from several sources. Initially,

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replacements groups were assembled from the VAC Sig Det and from the 24th and 30th Replacement Drafts. Later, as Shore Party consolidation progressed, Shore Party communication personnel were used as replacements for casualties in assault units.

(b) The landing of replacement personnel presented some difficulties during the first two days of the operation. Communication personnel of the two replacement drafts were dispersed among many ships, where they were employed in ship's platoons. Assembling groups of these personnel to send ashore to assault units was generally difficult, as communication with the various ships was slow, and boats were scarce. To remedy this condition in future operations it is believed that communication personnel of replacement drafts should be attached to the Signal Company and embarked in the ships carrying the Signal Officer and the Assistant Signal Officer.

PART V - RECOMMENDATIONS

1. TABLES OF ORGANIZATION. - The following changes in Tables of Organization are recommended. The changes are based not only on the experience in the IWO JIMA Operation, but on the experience gained from the preceding operations of this Division. The possibility of extended operations on large land masses has been considered in formulating these recommendations:

(a) Division Signal Company (F-91)

	<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
Warrant Officer		
Motor Transport (MT)	0	1
Technical Sergeant		
Inspector and mechanic (QM)(413)	0	1
Staff Sergeant		
Message Center Chief (CP)(674)	3	4
Field wire chief (CP)(595)	1	3
Sergeant		
Motor mechanic (QM)(014)	1	2
Assistant message center chief (CP)(674)	2	4
Corporal		
Motor mechanic (QM)(014)	1	2
Message center clerk (CP)(667)	1	4
Telegraph printer operator (CP)(237)	1	2

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	<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
Private First Class/Private		
Truck driver (345)	23	42
Mechanic (014)	0	4
Messenger (CP)(675)	21	33
Telegraph printer operator (CP)(237)	4	8
Telephone lineman (CP)(641)	47	45

(b) Joint Assault Signal Company (F-518)

Company Headquarters

Staff Sergeant		
Clerical (501)	0	1

Shore Fire Control Section

Lieutenant (jg)(USN)		
Naval Gunfire Liaison Officer	0	1
Sergeant		
Radio operator (CP)(776)	13	0
Radio operator - mechanic (CP)(174)	0	22
Corporal		
Field telephone man (CP)(641)	13	0
Radio operator (CP)(776)	13	35
Radar beacon operator (CP)	0	8
Private First Class/Private		
Field telephone man (CP)(641)	13	0
Radio operator (CP)(776)	0	88

Air Liaison Section

Captain		
Air Liaison Officer (ACI)	0	1
Lieutenant		
Air Liaison Officer	13	14
Corporal		
Radio operator (Avn)(755)	13	27
Private First Class/Private		
Truck driver (Avn)(245)	13	0
Radio operator (Avn)(755)	0	67

(1) The above changes in the JASCO Tables of Organization will provide for the following functional radio teams, with radio operators performing all incidental tasks, such as driving and wire laying, when necessary:

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- a. Battalion and Regimental Air Liaison Party:
Air Liaison Officer and radio mechanic.
SAR/SAD Nets Team (4 radio operators).
SAO Net Team (3 radio operators).
- b. Division Air Liaison Party:
Air Liaison Officer, two officer assistants,
and radio mechanic.
SAR/SAD Nets Team (4 radio operators).
SAD Secondary Net Team (3 radio operators).
SAO Net Team (3 radio operators).
- c. Battalion SFC Spotter Party:
Officer Spotter, liaison sergeant, and radio
mechanic.
SFC Net Team (4 radio operators).
- d. Battalion NGF Liaison Party:
NGF Liaison Officer and radio mechanic.
SFC Net Team (4 radio operators).
Division NGF Common Net Team (3 radio
operators).
- e. Regimental NGF Liaison Party:
Officer Spotter and liaison sergeant (for
replacements and special missions).
NGF Liaison Officer and radio mechanic.
NGF Control Net Team (3 radio operators).
Division NGF Common Net Team (3 radio
operators).
Radar Beacon Team (2 radar beacon operators).
- f. Division NGF Liaison Party:
Officer Spotter and liaison sergeant (for
replacements and special missions).
NGF Liaison Officer, one officer assistant,
and radio mechanic.
NGF Control Net Team (3 radio operators).
Division NGF Common Net Team (3 radio
operators).
Radar Beacon Team (2 radar beacon operators).

(2) Each of the above listed radio teams consists of 3 or 4 radio operators, the minimum capable of handling the portable equipment and operating for prolonged periods. Reduction in the number of specialist types will materially assist in keeping the teams up to strength during combat.

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(c) Communication Platoon, Headquarters Company, Infantry Battalion (F-4)

	<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
Private First Class/Private Truck driver (345)	2	4

(d) Communication Platoon, Headquarters and Service Company, Infantry Regiment (F-9)

Private First Class/Private Truck driver (345)	3	6
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(e) Communication Platoon, Headquarters and Service Battery, 105mm Howitzer Battalion (F-24)

Private First Class/Private Truck driver (345)	3	4
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(f) Communication Platoon, Headquarters and Service Battery, Artillery Regiment (F-29)

Corporal Field telephone man (CP)(641)	7	9
Private First Class/Private Truck driver (345)	4	12
Field telephone man (CP)(641)	22	28

(g) Headquarters and Service Company, Engineer Battalion (F-34)

Warrant Officer Communication	0	1
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(h) Headquarters and Service Company, Motor Transport Battalion (F-59)

Sergeant Radio operator-mechanic (CP)(174)	0	1
Corporal Radio operator (CP)(776)	2	6

(i) Tank Company, Tank Battalion (F-76)

Corporal Radio operator-mechanic (CP)(174)	0	1
Private First Class/Private Radio operator (CP)(776)	0	2

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PRESENT ALLOWANCE RECOMMENDED ALLOWANCE

(j)	<u>Headquarters and Service Company, Tank Battalion(F-79)</u>		
	Corporal		
	Radio operator-mechanic (CP)(174)	0	2
	Private First Class/Private		
	Radio operator (CP)(776)	2	4
(k)	<u>Marine Observation Squadron - VMO</u>		
	Warrant Officer		
	Communication	0	1
	Staff Sergeant		
	Communication Chief (CP)(542)	0	1
	Sergeant		
	Radio operator-mechanic (CP)(174)	0	1
	Corporal		
	Radio operator (CP)(776)	0	2
	Private First Class/Private		
	Radio operator (CP)(776)	0	4
(l)	<u>Amphibian Truck Company (E-705)</u>		
	Corporal		
	Radio operator-mechanic (CP)(174)	0	1
(m)	<u>Provisional Rocket Detachment</u>		
	Sergeant		
	Radio operator-mechanic (CP)(174)	1	1
	Corporal		
	Radio operator (CP)(776)	2	3
	Private First Class/Private		
	Radio operator (CP)(776)	3	8

2. TABLES OF ALLOWANCES. - The following changes in Tables of Allowances are recommended. These changes are based not only on the experience gained in the IWO JIMA Operation, but on the experience gained from the three preceding operations of this Division. The possibility of extended operations on large land masses has been considered in formulating these recommendations:

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PRESENT ALLOWANCE RECOMMENDED ALLOWANCE

(a) Division Signal Company

SIG-62	Case MCS-3	8	0
SIG-64	Chest BC-5	40	50
SIG-87	Gas Driven Generator EF	3	6
SIG-97	Head & Chest Set MHS-9	6	10
SIG-100	Holder M-167	15	50
SIG-110	Kit, Crystal Group NN	50	0
SIG-111	Kit, Crystal Group OO	50	0
SIG-121	Lantern TL-303/U	55	100
SIG-141	Motor Generator EG	2	6
SIG-146	Panel Set AP-30-C	15*	4
SIG-147	Panel Set AP-30-D	15*	4
SIG-152/8	Plow LC-61	0	2
SIG-162	Power Unit PE-95	2	5
-----	Radio Set RBY	0	1
SIG-192	Radio Set SCR-300	30*	40*
-----	Radio Set SCR-399	1	2
SIG-196	Radio Set SCR-510	0	6*
SIG-204	Radio Set SCR-608		
	(in Carrier, Cargo, M-29-C)	0	1
	(in Truck, $\frac{1}{4}$ -ton, 4x4)	3	10*
SIG-205	Radio Set SCR-610	6	30*
SIG-206	Radio Set SCR-624	2	0
SIG-207	Radio Set TCS		
	(in Carrier, Cargo M-29-C)	0	1
	(in Truck, $\frac{1}{4}$ -ton, 4x4)	7	12*
SIG-208	Receiver Power Unit EL	2	6
-----	Shelter HO-17	0	3
SIG-220	Signal Lamp Equipment EE-84	15*	4
SIG-221	Signal Lamp Equipment SE-11	50*	10*
SIG-235	Stamp MC-181	1	3
SIG-237	Steel Helmet, Navy Type	18	0
SIG-248	Telegraph Printer EE-97	2	5
SIG-249	Telegraph Set TG-5	8	4
SIG-278	Tool Equipment TE-50	1	2
SIG-285	Typewriter, Standard, W.U. Type	5	8
SIG-301/2	Wire, W-143 on DR-5, Miles	0	100
-----	Carrier, Cargo, M-29-C	0	3

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ANNEX EAST DIVISION OPERATION REPORT, IWO JIMA.

		<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
-----	Clock, 8-day	0	2
3208-33	Desk, field	3	6
-----	Duplicator, Fluid Process, Model SW	0	2
3091-29	Equipment, Drafting, Company, Set	0	1
3091-30	Expendable Supplies, Equip- ment, Drafting, Company, Set	0	1
2184-5	Fuse, Electric, Plug, 10- Amp, 125-Volt	0	100
2184-18	Insulator, Porcelain, Split Knob, 1-3/16" x 1-3/4" f/ No 12 to 14 Wire, w/Nail and Leather Washer	0	200
-----	Gun, Submachine, Cal. .45, Thompson, M1A1	0	7#
3154-69	Kit, Tool, Chassis and Motor Repair, Mechanic's, Complete	0	4
2184-7	Lamp, Electric, 60-Watt, 115-Volt, Medium Screw Base	0	100
-----	Lettering Set, Leroy	0	1
1097	Pistol, Automatic, Cal..45, M1911, w/1 Magazine	0	50#
2184-10	Socket, Weather-proof, Com- position, Medium Screw Base	0	50
2184-19	Switch, Entrance, Plug Fuse, 30-Amp, 125-Volt, Double Pole, 2-wire	0	12
3208-52	Table, Folding	1	7
-----	Trailer, 1/2-ton, 2-wheel, cargo (for Company Hq)	0	5
-----	Trailer, 1/2-ton, 2-wheel, greas- ing (for Company Hq)	0	1
-----	Trailer, 1-ton, 2-wheel, cargo (for Company Hq)	4	5
-----	Truck, 1/2-ton, 4x4, (for Company Hq)	13	16
-----	Truck, 1-ton, 4x4, cargo (for Company Hq)	0	4

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		<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
-----	Truck, 2 $\frac{1}{2}$ -ton, 6x6 cargo (for Company Hq)	8	10
-----	Truck, 2 $\frac{1}{2}$ -ton, amphibian (for Company Hq)	0	2
-----	Typewriter, Portable	0	3
2184-29	Wire, Copper, Solid, No.14 B&S Gauge, Rubber Covered, Double Braided, Ft (On reel, 3000 Ft to reel)	0	3000

(* Includes Division Emergency Pool)
 (# Company allowances of carbines to be reduced accordingly)

(b) Joint Assault Signal Company

(1) Shore and Beach Party Section

SIG-192	Radio Set SCR-300	0	7
SIG-205	Radio Set SCR-610	0	3
SIG-207/2	Radio Set TBX	20	10
SIG-218	Seat FN-1/GR	20	10
SIG-252	Telephone Central Office Set TC-4	0	1

(2) Shore Fire Control Section

SIG-87	Gas Driven Generator EF	0	4
SIG-100	Holder M-167	0	26
SIG-121	Lantern TL-303/U	0	26
SIG-188/8	Radio Set RBZ	0	5
SIG-192	Radio Set SCR-300	0	18
SIG-198	Radio Set SCR-536	26	18
SIG-207/2	Radio Set TBX	26	35
SIG-207/4	Radio Set TCS (in Truck, $\frac{3}{4}$ -ton, 4x4)	0	13
SIG-218	Seat FN-1/GR	26	35
-----	Truck, $\frac{3}{4}$ -ton, 4x4, Cargo	26	13
-----	Radar Beacon Mark II	0	4

(3) Air Liaison Section

SIG-85	Frequency Meter Set SCR-211	12	0
SIG-100	Holder M-167	0	26
SIG-121	Lantern, TL-303/U	12	27
-----	Radio Set AN/TRC-7	0	13

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	<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
SIG-188/3 Radio Set MAQ	1	0
SIG-188/8 Radio Set RBZ	0	14
----- Radio Set SCR-299/542	0	1
SIG-207/2 Radio Set TBX	12	27
SIG-207/4 Radio Set TCS (in Truck, $\frac{1}{2}$ -ton, 4x4)	0	5
SIG-218 Seat FN-1/GR	12	27

a. The recommended changes in the JASCO Tables of Allowances will provide the necessary equipment for the following functional radio teams:

1. Battalion Air Liaison Party:
SAR/SAD Net Team (AN/VRC-1, TBX,
AN/TRC-7)
SAO Net Team (TBX)
Monitoring (RBZ)
2. Regimental Air Liaison Party:
SAR/SAD Net Team (AN/VRC-1, TBX,
AN/TRC-7)
SAO Net Team (TCS, TBX)
Monitoring (RBZ)
3. Division Air Liaison Party:
SAR/SAD Net Team (SCR-299/542, TBX,
AN/TRC-7)
SAD Secondary Net Team (TCS, TBX)
SAO Net Team (TCS, TBX)
Monitoring (2 RBZ)
4. Battalion SFC Spotter Party:
SFC Net Team (TBX, SCR-300, SCR-536)
5. Battalion NGF Liaison Party:
SFC Net Team (TCS, TBX, SCR-300, SCR-536)
Division NGF Common Net Team (TBX)
6. Regimental NGF Liaison Party:
NGF Control Net Team (TCS, TBX)
Division NGF Common Net Team (TBX)
Beacon Team (Beacon)
Monitoring (RBZ)

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 ANNEX EASY TO 4TH MARINE DIVISION OPERATION REPORT, IWO JIMA.

7. Division NGF Liaison Party:
 NGF Control Net Team (TCS, TBX)
 Division NGF Common Net Team (TBX)
 Beacon Team (Beacon)
 Monitoring (2 RBZ)

(AN/TRC-7 is a newly developed portable radio set in the 100-156 MC band.)

(c) Headquarters Company, Infantry Battalion (Communication Platoon)

		<u>PRESENT ALLOWANCE</u>	<u>RECOMMENDED ALLOWANCE</u>
SIG-192	Radio Set SCR-300	9	12
SIG-204	Radio Set SCR-608 (in Truck, $\frac{1}{4}$ -ton, 4x4)	0	1
SIG-237	Steel Helmet, Navy Type	5	0
SIG-249	Telegraph Set TG-5	2	0
-----	Carrier, Cargo M-29-C	0	1

(d) Weapons Company, Infantry Regiment (Communication Section)

SIG-97	Head and Chest Set MHS-9	2	0
SIG-237	Steel Helmet, Navy Type	8	0

(e) Headquarters and Service Company, Infantry Regiment (Communication Platoon)

SIG-207/4	Radio Set TCS (in Truck, $\frac{1}{4}$ -ton, 4x4)	2	3
SIG-249	Telegraph Set TG-5	4	0
-----	Carrier, Cargo M-29-C	0	2
-----	Trailer, $\frac{1}{2}$ -ton, 2-wheel, cargo	0	2

(f) Headquarters and Service Battery, 105mm Howitzer Battalion (Communication Platoon)

-----	Carrier, Cargo, M-29-C	0	1
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(g) Headquarters and Service Battery, 155mm Howitzer Battalion (Communication Platoon)

-----	Carrier, Cargo, M-29-C	0	1
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(h) Headquarters and Service Battery, Artillery Regiment (Communication Platoon)

-----	Carrier, Cargo, M-29-C	0	2
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(i) Headquarters and Service Company, Engineer Battalion

SIG-192	Radio Set SCR-300	8	12
SIG-196	Radio Set SCR-510	0	1%

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		PRESENT ALLOWANCE	RECOMMENDED ALLOWANCE
	SIG-207/2 Radio Set TBX	1	5
	SIG-218 Seat FN-1/GR	1	5
	(% Contingent on approval of issue of Engineer-Armored vehicles to Engineer Battalion)		
(j)	<u>Headquarters and Service Company, Motor Transport Battalion</u>		
	SIG-50/5 Book, Signal Failure Report PM-4	0	2
	SIG-207/4 Radio, Set TCS, (in Truck, $\frac{1}{2}$ -ton, 4x4)	2	5
	(in Carrier, Cargo, M-29-C)	0	1
	SIG-274 Tool Equipment TE-36	0	1
(k)	<u>Amphibian Truck Company</u>		
	SIG-50/5 Book, Signal Failure Report PM-4	0	1
	SIG-205 Radio Set SCR-610	0	6
	SIG-274 Tool Equipment TE-36	0	1
(l)	<u>Provisional Rocket Detachment</u>		
	SIG-50/5 Book, Signal Failure Report PM-4	0	2
	SIG-64 Chest BC-5	0	1
	SIG-95/5 Head & Chest Set H-25/GT	0	4
	SIG-100 Holder M-167	0	3
	SIG-192 Radio Set SCR-300	0	5
	SIG-198 Radio Set SCR-536	0	6
	SIG-204 Radio Set SCR-608 (in Truck, $\frac{1}{2}$ -ton, 4x4)	0	3
	SIG-209 Reel Equipment CE-11	0	4
	SIG-274 Tool Equipment TE-36	0	1
	SIG-301 Wire W-130	0	4
(m)	<u>Marine Observation Squadron - VMO</u>		
	SIG-50/5 Book, Failure Report PM-4	0	2
	SIG-64 Chest BC-5	0	1
	SIG-85 Frequency Meter Set SCR-211	0	1
	SIG-100 Holder M-167	0	2
	SIG-274 Tool Equipment TE-36	0	1

(1) Automatic items have not been included in the above recommendations. The allowances of all such items should be changed in conformity with the above recommendations and in conformity with the recommendations for changes in Tables of Organization.

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ANNEX EASY TO 4TH MARINE DIVISION OPERATION REPORT, IWO JIMA.

(n) It is recommended that the present basis of issue of wrist watches, 15 to 17 jewel, with wristlet, be broadened so as to provide the following additional distribution:

1 per message center enlisted below staff grade.

3. NEW EQUIPMENT - The following recommendations for the expeditious development of issue of new types of signal equipment are based upon the extensive combat experience of this Division. They envisage future operations on large land masses as well as small highly fortified islands.

(a) The TCS remote should provide interphone facilities.

(b) An ultra-portable voice scrambler should be provided for all types of radio equipment from SCR-610 to SCR-399. It is believed that the Army has developed such a scrambler with sufficient security for tactical communications.

(c) Radio teletype equipment should be issued to the Division Signal Company for use with the next higher echelon of command.

(d) Issue of Radio Set SCR-619 to replace Radio Set SCR-610 should be expedited, with priority to artillery forward observer teams.

(e) Every effort should be made to expedite the development and issue of lightweight switchboards for Battalions and Regiments.

(f) An ultra-portable tape facsimile machine should be provided to replace the telegraph between Division and Regiments. It is believed that the Army has developed such a device.

(g) If Air Liaison Parties are to control air strikes in future operations, a portable VHF radio set, such as the Army's new AN/TRC-7, should be provided for each party to supplement the vehicular AN/VRC-1.

(h) There is an immediate and urgent need for the development of a radio set similar in design to the SCR-300 but operating on frequencies from 48 to at least 60 megacycles.

(i) Electronic balloon tracking equipment, such as SCR-658, should be furnished to the Artillery Regiment.

4. MODIFICATIONS TO PRESENT EQUIPMENT

(a) The cable connectors for the SCR-510/610 should be

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ANNEX EASY TO 4TH MARINE DIVISION OPERATION REPORT, IWO JIMA.

thoroughly protected from saltwater corrosion.

(b) The hand generator of the EE-8B field telephone "freezes" after being subjected to dampness. More thorough moisture proofing is necessary.

(c) At present Drum DR-8 is issued with only one-quarter mile of W-130 wire. The DR-8 should be issued completely filled with W-130.

(d) The Sound Power Handset TS-10 and Reel RL-39 should be issued as separate Table of Allowance items rather than combined as Reel Equipment CE-11. The allowances of TS-10's should be double the present allowances of CE-11's, and the replenishment rate on the TS-10 should be at least 25%.

(e) Staggered clips should be provided on the TS-10 to reduce the possibility of shorting out the line, a frequent and annoying occurrence at present.

(f) The high-speed coils of W-130 wire should be lighter and less bulky than the present one-mile coil. A one-half or three-quarter mile coil is recommended. The metal housing for the coil should be of stronger material.

(g) Headset MHS-11 should replace all types of radio headsets now in use and should become the standard Marine Corps headset.

(h) Microphone MT-1 should be provided with a hand-holder for the microphone button, and should be standardized as the universal microphone for the Marine Corps, replacing all types now in use.

5. PLANNING

(a) The effective shackle numeral cipher for each operation should be printed on water-resistant paper and distributed in ready-to-use form by Landing Force or higher echelon. A distribution of 1200 copies of each day's shackle grid is recommended for each Division.

(b) In assigning SCR-300 channels, adjacent channels should not be allocated to a Division. Channels should be separated as widely as possible within each Division to minimize interference.

(c) Divisions should be given more definite instructions as to which cryptographic channels are to be carried on an operation.

(d) While the present method of station authentication is

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very good, a more secure system can be provided with slight modification. It is recommended that the challenging station send four random letters, instead of three, and that the challenged station reply by transmitting four letters which "touch" the challenge letters in the effective shackle grid, but transmitting them in reverse order.

(e) A Radio Intelligence Platoon should be attached to each Division Signal Company.

6. TRAINING

(a) Navajo Indian talkers should be thoroughly trained in voice radio procedure and should be trained in a standard Navajo military vocabulary. Voice radio nets for training Navajos should be established between Divisions in rear areas.

(b) The radio countermeasures instruction conducted by FMF Pacific should be continued.

(c) FMF Pacific should continue and extend the training courses in the operation and maintenance of new types of equipment.

(d) FMF Pacific schools should be established for basic re-training of Air Liaison and Shore Fire Control Sections of the Joint Assault Signal Companies between operations.

7. REPLACEMENT PERSONNEL - TRAINING

(a) All replacement communication personnel should have a working knowledge of signal equipment used by Fleet Marine Force units prior to joining a combat organization. Repair personnel, especially, should be schooled in the maintenance of signal equipment used in the Division. If this training cannot be accomplished in the United States, it should be undertaken at FMF Pacific.

(b) Non-commissioned officers in replacement drafts should be able to assume duties commensurate with their rank when transferred to communication organizations in combat.

(c) Replacement personnel should be received in sufficient time prior to an operation to permit proper orientation and training.

8. REPLACEMENT PERSONNEL - ASSIGNMENT

(a) It is recommended that all Replacement Draft communication personnel be released for assignment to the Signal Company for training prior to an operation, and for cooperation with the

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Signal Company.

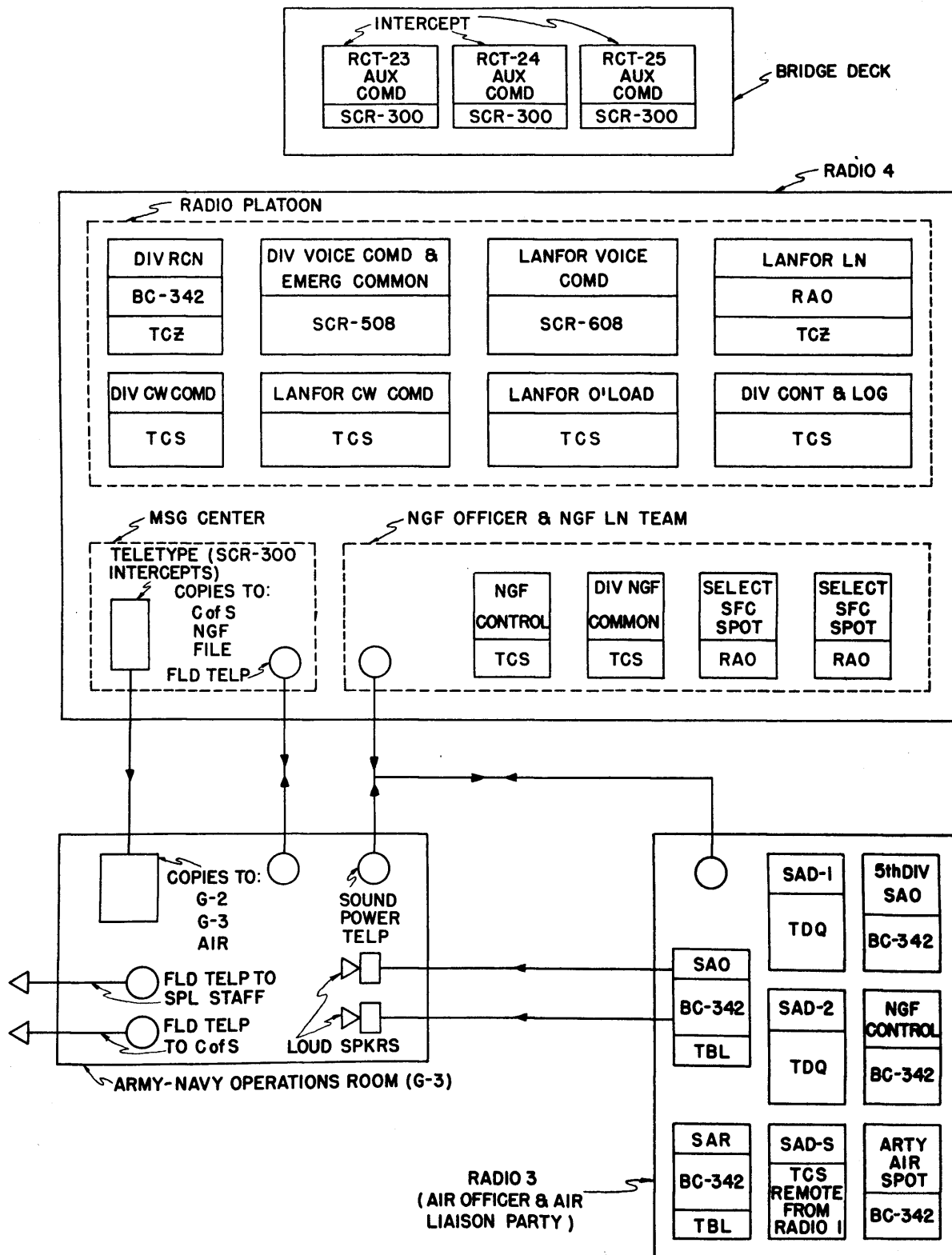
9. REHEARSAL

(a) Rehearsal plans should provide for the exercise of signal supply and communication personnel replacement functions by assessing casualties to both equipment and personnel.

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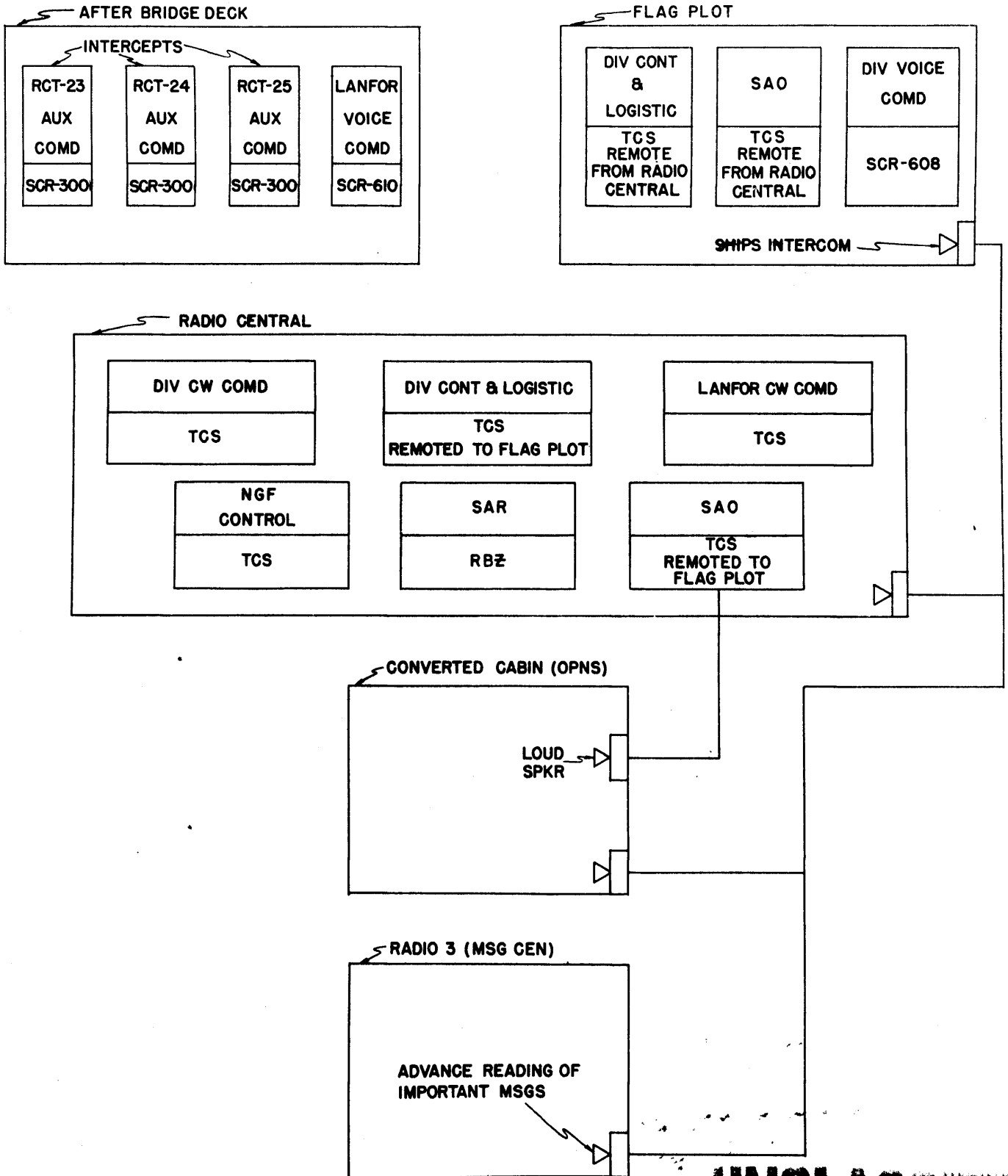
SCHEMATIC DIAGRAM OF 4th MAR DIV COMMUNICATIONS INSTALLATION ABOARD USS BAYFIELD (APA 33)



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SCHEMATIC DIAGRAM OF 4th MAR DIV (ADC-GP) TACTICAL COMMUNICATION INSTALLATION ABOARD USS MELLETTE (APA 156)



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APPENDIX C TO ANNEX EASY TO 4TH MARINE DIVISION

OPERATION REPORT - IWO JIMA

REPAIR OPERATIONS BY DIVISION SIGNAL REPAIR SHOP

<u>ITEM</u>	<u>TURNUED IN FOR REPAIR</u>	<u>RETURNED TO SERVICE</u>
Handset TS-15-A	129	118
Head & Chest Set HS-19	22	20
Head & Chest Set H-25/GT	25	21
Public Address System MPA-1	1	1
Radio Set AN/VRC-1	6	6
Radio Set SCR-284	5	5
Radio Set SCR-300	204	187
Radio Set SCR-536	250	217
Radio Set SCR-610	103	91
Radio Set TBX	56	52
Radio Set TCS	33	28
Switchboard BD-71	19	18
Switchboard BD-72	4	4
Telephone EE-8	238	195

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