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DISTRIBUTION OF THE LIGHTWEIGHT' RADIO TRANSMITTER AN/PRT 4 AND
RADIO RECEIVER AN/PRR 9 (SQUAD RADIO SETS) WITHIN THE RIFLE
COMPANY, INFANTRY BATTALION, INFANTRY BATTALION (MECH)
AND AIRBORNE INFANTRY BATTALION

by
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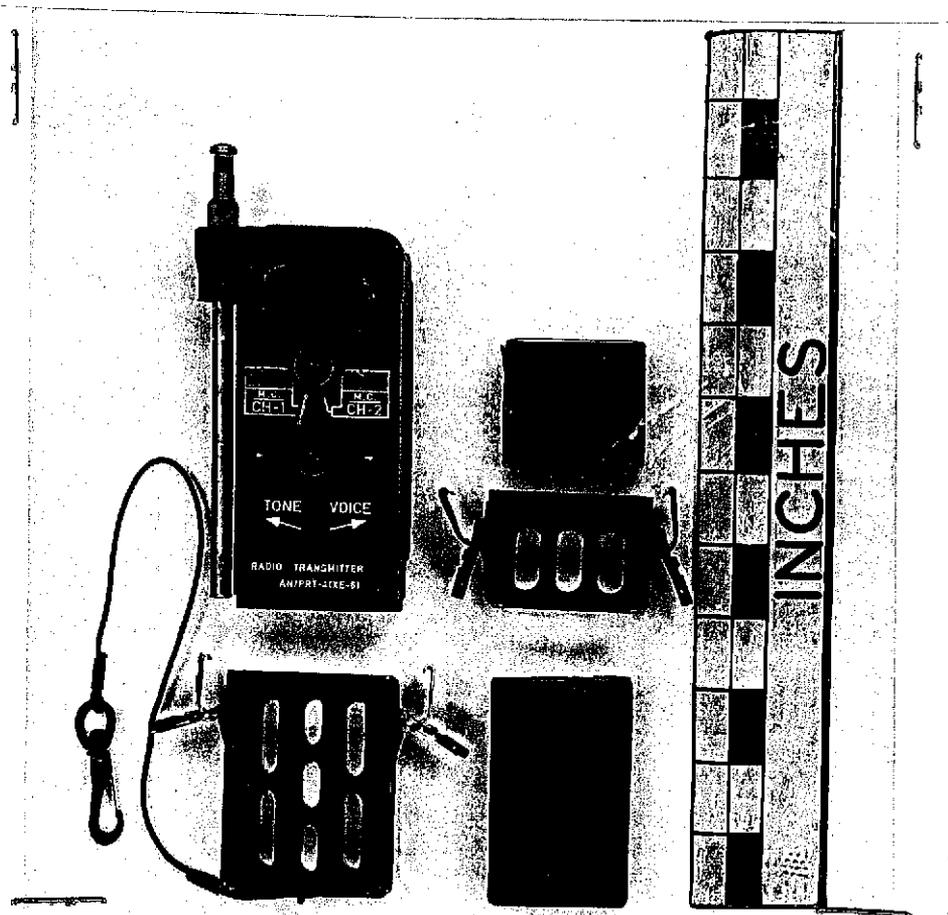
The United States Army Infantry School
Fort Benning, Georgia
14 December 1964

SUBJECT: Distribution of the Lightweight Radio Transmitter AN/PRT 4 and Radio Receiver AN/PRR 9 (Squad Radio Sets) within the Rifle Company, Infantry Battalion, Infantry Battalion (Mech), and Airborne Infantry Battalion.

1. PROBLEM. To determine a basis of issue for the new squad radio sets within the rifle company, infantry battalion, infantry battalion (mech), and airborne infantry battalion (TOE's 7-18E, 47E and 37E).
2. ASSUMPTIONS.
 - a. The radio transmitter AN/PRT 4 and the radio receiver AN/PRR 9 will be classified standard type A in their present configurations upon completion of suitable engineer and service testing.
 - b. Item cost and appropriate procurement funding is not a limiting or prohibitive factor in establishing a basis of issue.
 - c. Availability and allocation of additional FM frequencies to accommodate the resulting increased density of radios within the combat zone is not a limiting or prohibitive factor in establishing a basis of issue.
3. FACTS BEARING ON THE PROBLEM.
 - a. Communications is the means by which the infantry small unit leader controls his unit. Communications to be effective must be clear, concise, accurate and timely. (1:18)
 - b. Although radio is the least secure means of communication it offers speed and person-to-person contact. It reduces the exposure time of small unit leaders to hostile fire and extends the range of communications. (1:18)
4. DISCUSSION.
 - a. For a description of squad radio sets see Annex A.
 - b. For details of discussion see Annex B.
 - c. The development of the squad radio sets is a logical step forward in the program to improve tactical communications within the infantry battalion. In order to take full advantage of the improved control capabilities these sets provide it is necessary that they be provided to the lowest echelon that has a requirement for these capabilities.
 - d. The new squad radio set is superior in characteristics and performance to the radio set AN/PRC 6, currently in use within the rifle platoon. As such it is suitable as an item replacement for the AN/PRC 6.
 - e. The rifle and weapons squad leaders must be able to communicate with their platoon leader to receive instructions and report information. Providing each of these individuals an AN/PRR 9 receiver and an AN/PRT 4 transmitter satisfies this requirement. Establishing a platoon net in this manner using channel 1 of the AN/PRT 4 will provide reliable communications within a 1500 meter operating range.
 - f. The rifle squad leader is normally in a position where he can

ANNEX A -- Description of Squad Radio Sets

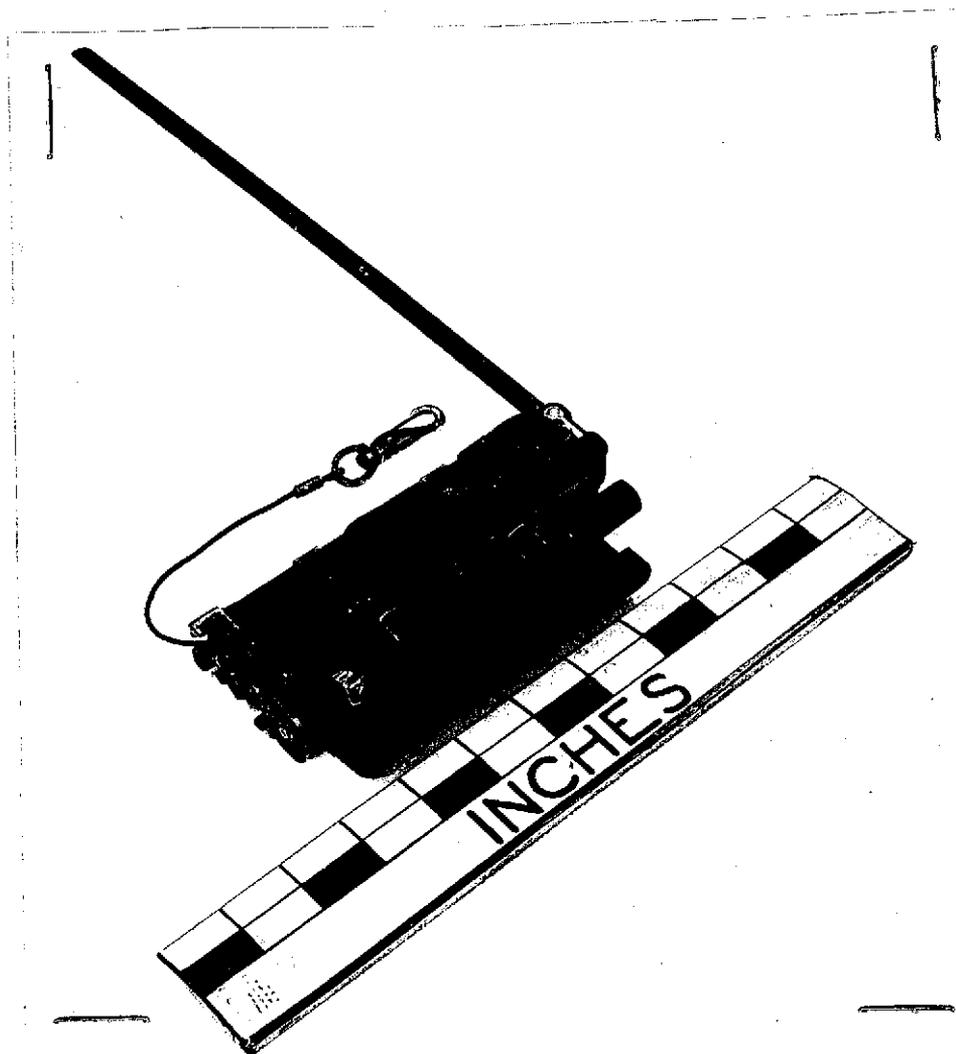
1. Radio transmitter AN/PRT 4 (5:7):
 - a. General. Radio transmitter AN/PRT 4 is a hand held, battery operated, dual-channel transmitter capable of transmitting voice or internally-generated tone signals. It is self-contained and has two controls, the channel switch and the voice-tone switch. The two channels may be separated up to 1 mc in frequency within the band 47 to 57 mc. Channel 1 has an operating range of 1500 meters and channel 2 has an operating range of 500 meters.
 - b. Antenna. The collapsible antenna is approximately 24 inches long when extended and slides down along the transmitter case when collapsed. It is easily replaced by the operator in case of damage.
 - c. Operating controls. Only two controls are required for operation of the transmitter. A positive-detent, two-position switch selects either channel 1 or channel 2. A spring return, two position switch allows the operator to select either tone or voice modulation. In the TONE position, an internally-generated tone of approximately 1200 cps is transmitted. In the VOICE position, transmission of voice is accomplished by speaking into the built-in microphone.
 - d. Battery. The transmitter is powered by battery, type BA-399/PRT 4. The battery is secured to the transmitter by a battery case which attaches to the transmitter by two clasp-type latches. The battery can be replaced quickly, even in the dark, because the battery connector is positioned so that the battery can be inserted only one way.



CONTINUATION OF ANNEX A.

2. Radio receiver AN/PRR 9 (5:6):

- a. General. Radio receiver AN/PRR 9 is a self-contained, single-channel receiver designed to be used on a standard combat helmet, clipped to a harness, or in a shirt pocket. A lanyard is used as a retainer to prevent loss. Three clips are mounted on the receiver case, two of which are used for clipping the receiver to the helmet, and the other is used to clip the receiver to the harness. A 12 inch flexible tape antenna is provided. The horn transducer directs sound toward the operator's ear. An earphone is supplied which plugs into the receiver jack, automatically disconnecting the horn.
- b. Operating controls. The receiver has a multi-purpose on-off, volume, squelch control. When the control is turned clockwise from its off position, the receiver is energized. As the control is advanced, the volume is increased. As the control is advanced farther to near maximum clockwise rotation, a light detent is felt. This detent operates a switch which disables the squelch. The volume can now be controlled without squelch until the receiver is turned off.
- c. Battery. A tubular battery, type BA 505/PRR 9 furnishes power to the receiver. The battery is located outside the receiver housing. The battery can be quickly removed and replaced.



ANNEX B -- Discussion

1. The introduction of a new family of vehicular and portable radios in the infantry battalion within the past few years has had a tremendous impact on the ability of the battalion commander and his subordinate commanders to effectively control their units. The new AN/VRC 12 family of vehicular radios has doubled the operating radius of the battalion command net from 16 to 32 kilometers (4:81). The AN/PRC 25 family, to include the AN/VRC 53, the AN/GRC 125 and the proposed AN/PRC 25 with amplifier, has not only increased the effective operating range of the company command net but has significantly increased the reliability and flexibility of radio communications within the company.
2. The development of the AN/PRT 4 transmitter and its companion AN/PRR 9 receiver as a squad radio set is a logical continuation in the program to improve radio communications throughout the infantry battalion. In order to take maximum advantage of the increased control capabilities afforded by the squad radio set it is necessary to provide these sets to the lowest echelon that has a requirement for radio communications facilities.
3. Engineer and service testing to date has revealed that the new squad radio set has the following advantages over the present squad radio set AN/PRC 6:
 - a. Lighter weight: 1.8 lbs against 7.5 lbs (both with batteries and accessories) (5:3, 4:21).
 - b. Less Bulky and easier to handle and operate.
 - c. Greater range and operating reliability.
 - d. Two channels of communication and two modes of transmission on the AN/PRT 4 versus only one each on the AN/PRC 6.
 - e. Batteries are smaller and lighter.
 - f. Maintenance is simplified.

Based on the above it is obvious that the new squad radio set is suitable as an item replacement for the AN/PRC 6 radios within the rifle platoon nets of the rifle companies. Equipping each rifle platoon leader, platoon sergeant and squad leader in this manner will considerably improve the reliability of the platoon net and the ability of the platoon leader to control his unit. The rifle platoon command frequency is set on the AN/PRR 9 receiver and channel 1 of the AN/PRT 4 transmitter. Channel 2 of the AN/PRT 4 transmitter is then available for individual squad nets. To organize a squad net it is necessary to determine which individuals in the squad the squad leader requires radio communication with and should these individuals have the capability of two way communications.

4. Each rifle squad has two fire team leaders who assist the squad leader in controlling the squad. As a minimum, each of these team leaders requires an AN/PRR 9 receiver. Normally the squad leader communicates with his team leaders by one or more of the following methods: orally, visually or by personal contact. Equipping each team leader with an AN/PRR 9 receiver provides an impressive addition and supplement to these methods. The squad leader's key role in combat is to provide guidance and instructions to the members of his squad through his team leaders. He is usually in a position where he can observe all activity within his area of responsibility and influence the action. His primary

CONTINUATION OF ANNEX B

communications requirement then, is to be able to talk to his subordinates. Each team leader having an AN/PRR 9 receiver satisfies this requirement. Although it may be desirable to have two way communications by providing each team leader an AN/PRT 4 transmitter, the following disadvantages outweigh this limited advantage:

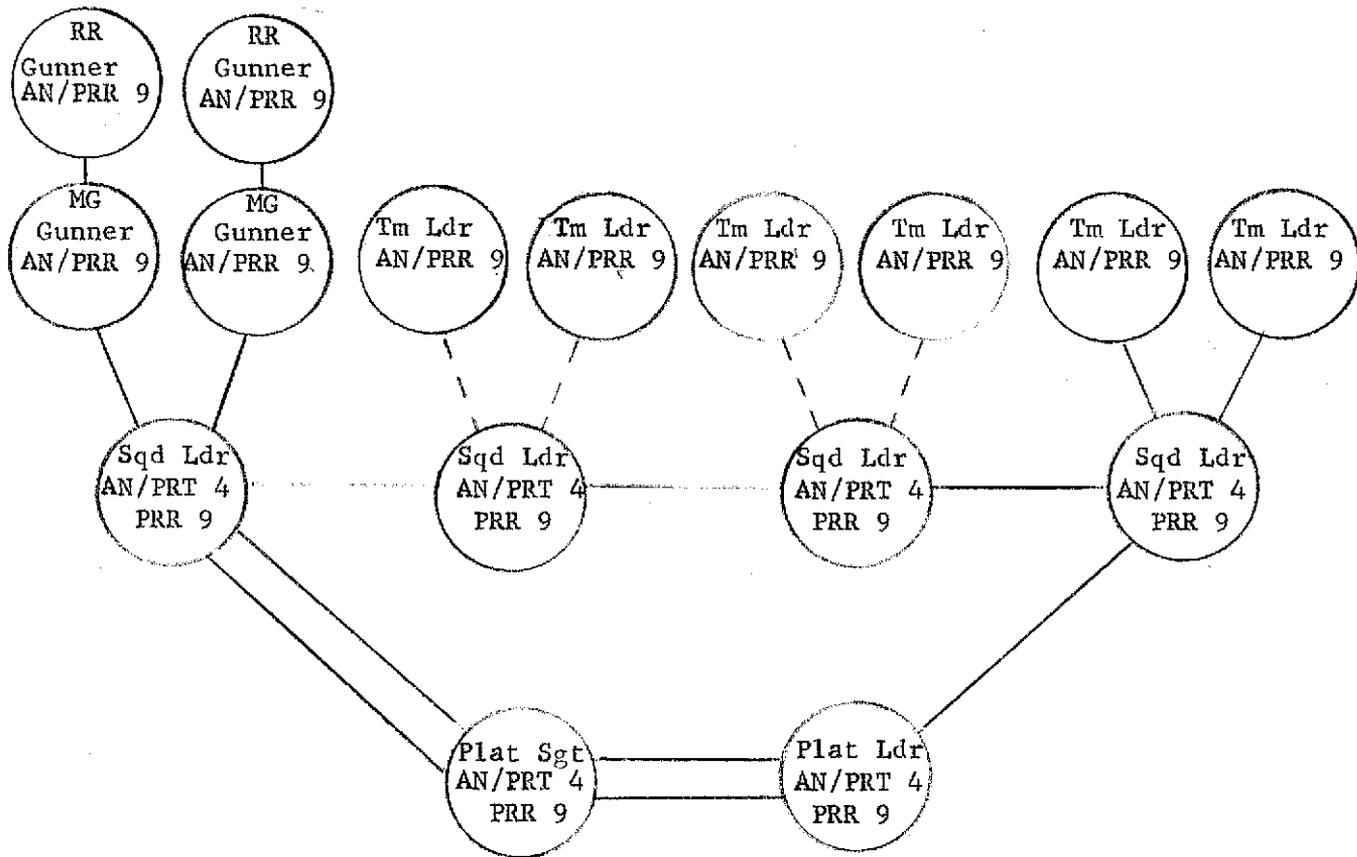
- a. The squad leader would require two AN/PRR 9 receivers: one for the platoon net and one for the squad net.
 - b. Poor utilization of the capabilities of the AN/PRT 4 transmitter since the team leader would only require the use of channel 2.
5. In addition to the team leaders, other key men in the rifle squad are the automatic riflemen and the grenadiers. Providing them AN/PRR 9 receivers would give the squad leader the capability of having immediate, direct contact with his fire support elements. However, the primary responsibility of the team leaders is to assist the squad leader in the control of these key individuals. The team leaders will normally be in a position where they can physically direct the activities of these key individuals and the other men in their teams. Providing AN/PRR 9 receivers to additional squad members would not, therefore, particularly improve the squad leader's ability to control his squad.
6. Within the weapons squad of the rifle platoon there is a somewhat different situation. The weapons squad leader is responsible for controlling two machine gun teams and two recoilless rifle teams. These four weapons provide the bulk of the platoon's organic fire support. Even though these weapons may be widely separated on the battlefield they must be immediately responsive to the needs of the platoon. For this reason, each gunner should be provided an AN/PRR 9 receiver to supplement normal methods of control. The frequency on these receivers will be the same as the channel 2 frequency on the weapons squad leader's AN/PRT 4. Additionally, this same frequency should be set on the channel 2 position of the platoon leader and platoon sergeant's AN/PRT 4. This will insure that the close fire support weapons of the platoon are immediately responsive to the key leaders of the platoon.
7. Distribution of the squad radio sets on the basis of the above discussion would put a total of 18 AN/PRT 4 transmitters and 48 AN/PRR 9 receivers in the rifle company. Although these radio sets will be distributed in accordance with tables of organization and equipment, the company commander must have sufficient latitude to modify the distribution for any given situation; i. e., providing additional sets from one platoon to another platoon that has the mission of occupying widely dispersed outposts (outguards) on a combat outpost line.

ANNEX C -- Proposed Basis of Issue

- Proposed distribution of squad radio sets within the rifle company, infantry battalion, infantry battalion (mechanized), and airborne infantry battalion (TOE's 7-18E, 47E and 37E):

	<u>AN/PRT 4</u>	<u>AN/PRR 9</u>
<u>3 Rifle Platoon Headquarters</u>		
Platoon Leader	3	3
Platoon Sergeant	3	3
<u>9 Rifle Squads</u>		
Squad Leader	9	9
Team Leader	-	18
<u>3 Weapons Squads</u>		
Squad Leader	3	3
Machine Gunners	-	6
Recoilless rifle gunners	-	6
<u>TOTAL</u>	18	48

- A typical platoon net diagram using the above basis of issue would appear as depicted below:



- Platoon command net, AN/PRT 4 channel 1
- 1st Squad net, AN/PRT 4 channel 2
- - - - - 2nd Squad net, AN/PRT 4 channel 2
- 3rd Squad net, AN/PRT 4 channel 2
- Wpn Squad net, AN/PRT 4 channel 2

ANNEX X -- Bibliography

1. FM 7-15, Infantry, Airborne Infantry and Mechanized Infantry Rifle Platoons and Squads (Washington, D. C.: Department of the Army, January 1962)
2. FM 23-12, Technique of Fire of the Rifle Squad and Tactical Application (Washington, D. C.: Department of the Army, May 1963)
3. Special Text 7-11-3, Rifle Company, Infantry, Airborne Infantry, and Mechanized Infantry (Fort Benning, Georgia: United States Army Infantry School, 1 September 1961)
4. Communications Data Book (Fort Benning, Georgia: United States Army Infantry School, August 1964)
5. Operation, Maintenance Instructions and Parts List for Radio Receiver AN/PRR 9, Radio Transmitter AN/PRT 4 and Associated Test Equipment (Fort Monmouth, New Jersey: United States Army Electronic Research and Development Laboratory Contract No. DA 36-039 AMC-00029(E) to Delco Radio Division, General Motors Corporation, December 1963)
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