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Vol. VI SIGNAL EQUIPMENT

DEPARTMENT OF THE ARMY .

WASHINGTON, D. C.

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FOREWORD

The object of this publication, the sixth volume in a series on foreign military weapons and equipment, is to present essential technical, tactical, and recognition data on all types of signal equipments used by foreign ground forces.

Each item is given the following treatment: (1) a photograph; (2) tactical characteristics, and employment; (3) identification features; (4) technical characteristics.

The publication is in loose-leaf form to facilitate periodic amendment. Supplements and revisions will be issued as new information becomes available.

Items are presented according to the using country. These countries are grouped in the following four sections:

Section I. U. S. S. R.

Section II. Soviet Satellites.

Section III. North Atlantic Pact.

Section IV. Other Countries.

For each country, the various categories of signal equipments are not segregated but are treated as individual items numbered consecutively.

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U. S. S. R. RESTRICTED

INTRODUCTION

Soviet signal equipment generally is found to be of maximum simplicity consistent with the fulfilment of its required tactical mission. Soviet signal doctrine requires minimum usage of communications facilities, with the result that signal equipment is often of smaller capacity and less complex than foreign equipment intended for a similar installation. In certain cases operator efficiency is impaired somewhat by these simplifications, but, in other cases, eliminations are considered merely to be of nonessentials, since operator ease and comfort are not regarded as of major importance. Ruggedness and ease of maintenance are held to be of prime importance, and these qualities are seldom compromised.

The design of Soviet signal equipment reflects the requirement of simplicity in all phases of Soviet communications practice and equipment. Under this policy, equipment is designed to provide adequate service, but operating aids are held to a minimum and are eliminated wherever possible. Expendable items of equipment are cheap to the point of being crude, as in the case of dry cells, but they perform satisfactorily. Foreign influence, both German and United States, can be seen in current Soviet signal equipment. German thinking is recognized in the fact that certain recent radio sets use but a single tube type; this simplifies the stocking of spare parts, but requires some sacrifice in efficiency. Further German influence can be seen elsewhere, and peculiarities of design characteristics have allowed tentative identification of specific former Wehrmacht project engineers. American influence appears in over-all design and lay-out; certain current Soviet radio sets are almost direct copies of United States sets.

What has been stated of the design of Soviet equipment likewise applies to its construction, especially of recent equipment. Here, ease of construction, ruggedness, and ease of maintenance appear to be prime factors. In some cases, new models of equipment are found to be larger than old models, providing more space for cooling and greater accessibility to components. This is in

contrast to the current American trend toward miniaturization of components. Contrary to popular opinion prior to the outbreak of hostilities in Korea the construction of current equipment is excellent, and developments such as sealed components and their proven capability of mass production using rigid quality control demonstrate American influence. This represents a marked improvement over production practices used at the close of World War II in 1945.

It should be noted that the following list contains many items which are probably obsolete; however, in the absence of concrete information that they are—(a) no longer used (b) not disposed of through salvage, it is felt desirable that they should be included, subject to revision upon receipt of positive intelligence at a future date. This list will include all known signal equipment of Soviet manufacture, whether or not its use by the Soviet armed forces has been definitely established; it is assumed that signal equipment supplied to Satellite nations is at least similar to that in use in the Soviet Army.

Soviet employment of the various means of signal communication depends upon factors of type of formation involved, terrain, and the existing situation. It has been possible, nevertheless, to evolve certain basic principles in the use of the facilities.

a. Wire communication. Facilities included are telephone, telegraph, and teletype, and is the basic means of communication in all echelons of the Soviet ground forces. It reaches maximum volume during defensive or static operations. In offensive operations its use is limited and in all cases, its technical application will be governed by the arm and operational phase. In general, telephone communications will reach down to company level in the infantry and battery level in the artillery; telegraph does not extend below divisional level and teletype is used at corps level and up. Wire security measures include transmission by means of code tables and proper placement of the wire lines. Although the Soviets

flexibility of radio, they still prefer ications whenever possible.

mmunication. The Soviets employ ile, and stationary radio sets. Radio n has been given increasing attentilocation of radio equipment to the ns of the Signal Units has more than be beginning of World War II. Radio n assumes primary importance durid and offensive operation. Similar ares as they exist for wire communicable to radio transmission. The tion of radios is as follows: down to in the infantry and down to battery illery.

gnals. Although visual signals were

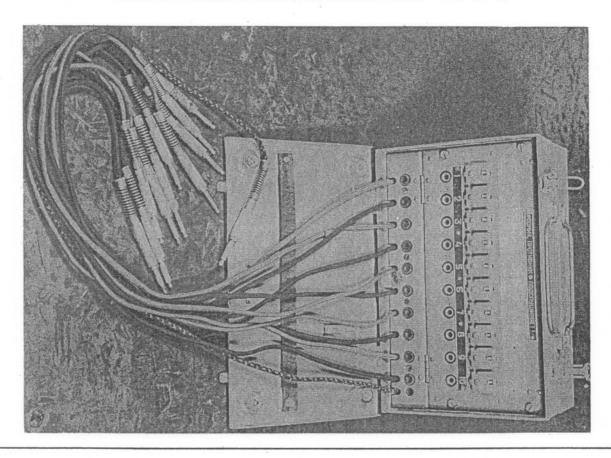
extensively used as a means of establishing communication of command and coordination during World War II, their present significance has been considerably reduced. The use of visual signals was instrumental in reducing over-all requirements for radio and wire traffic during combat operations and particularly in the forward elements. The various facilities included rockets, tracer bullets, smoke bombs, signal panels, semaphore, heliograph, light signaling devices (mounted on tanks), and available materials such as boards, limbs, etc. The visual signals are used primarily to indicate disposition of forces, attainment of predetermined phase lines, for artillery support and firing instructions to tanks and artillery.

GLOSSARY OF RUSSIAN TERMS

Cyrillic	Transliteration	Translation
AHTEHHA	ANTENNA	Antenna
ВНИМАНИЕ	VNIMANIE	Attention
ВЫКЛЮЧАТЕЛЬ	VIKLUCHATEL	Switch
ГРОМЧЕ	GROMCHE	Louder :
ДИАПАЗОН	DIAPAZON	Band
ЗАВОД	ZAVOD	Factory
ЗВОНОК	ZVONOK	Bell
ИНДИКАТОР	INDIKATOR	Indicator
КАЛИБРАТОР	KALIBRATOR	Calibrator
КОМПЕНСАЦИЯ	KOMPENSATSIYA	Compensation
контроль	KONTROL	Control
ключ	KLUCH	Key
МИКРОФОН (МИКР.)	MIKROFON	Microphone
НАЖАТЬ	NADJAT	Press
НАКАЛ	NAKAL	Filament
НЕПРИЯТЕЛЬ	NEPRIYATEL	Enemy
ПОДСЛУШИВАЕТ	PODSLUCHIVAET	Listen
ОБРАТ. СВЯЗЬ	OBRAT. SVIAZ	Regeneration
ПЕРЕДАЧА	PEREDACHA	Transmit
ПРИЕМ	PRIEM	Receive
ПЕРЕДАТЧИК	PEREDATCHIK	Transmitter
ПРИЕМНИК	PRIEMNIK	Receiver
НАСТРОЙКА	NASTROYKA	Tuning
ПИТАНИЕ	PITANIE	Current
CBET	SVET	Dial Light
ТЕЛЕФОН (ТЛФ)	TELEFON	Telephone
ТИП	TIP	Type
ТИШЕ	TISHE	Quieter
ТЕЛЕГРАФ (ТЛГ.)	TELEGRAF	Telegraph
УМФОРМЕР	UMFORMER	Dynamotor
PA3robop	RAZGOVOR	Talk
СТАНЦИЯ	STANTSIYA	Station

Field Switchboard Type K-10

ПОЛЕВОЙ ИНДУКТОРНЫЙ КОММУТАТОР ТИП К-10

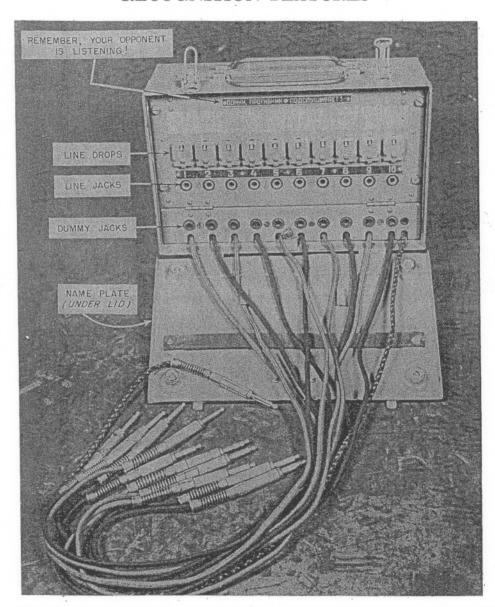


The K-10 switchboard is the standard Soviet Army switchboard used at and below division level. It can accommodate ten magneto-type telephone lines. Several switchboards may be used in parallel to give larger capacity, but Soviet doctrine does not permit more than two boards to be used at a time. Small, light, and compact,

it is tactically effective, although it provides a minimum of operating aids.

An external telephone, usually a TAI-43 is required to operate this board. The disadvantages are that it lacks night alarm, operator's ring-talk keys, and night illumination.

Field Switchboard Type K-10 RECOGNITION FEATURES



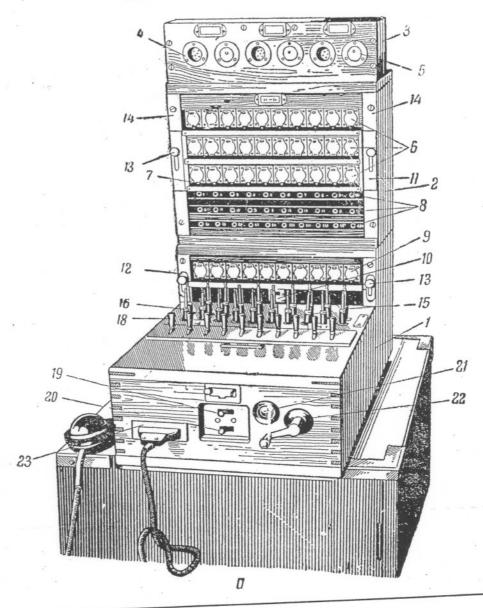
CHARACTERISTICS

.A.			II. TECHNICAL CHARACTERISTICS:
it	Size 11.5" x 5.5" x 7"	Weight 15 lbs.	Number of lines

U. S. S. R. Item 22

Field Switchboard Type PK-30

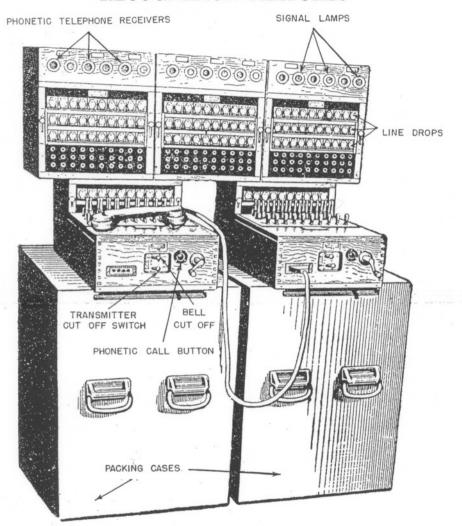
коммутатор тип пк-30



The PK-30 is a field telephone switchboard designed for use in communication centers at Infantry Division and higher headquarters. It serves 30 telephone lines of which 25 are for

magneto type telephones, three lines for phonetic telephones (requiring constant monitoring) and two with common battery lines. It cannot be used for automatic central lines.

Field Switchboard Type PK-30 RECOGNITION FEATURES

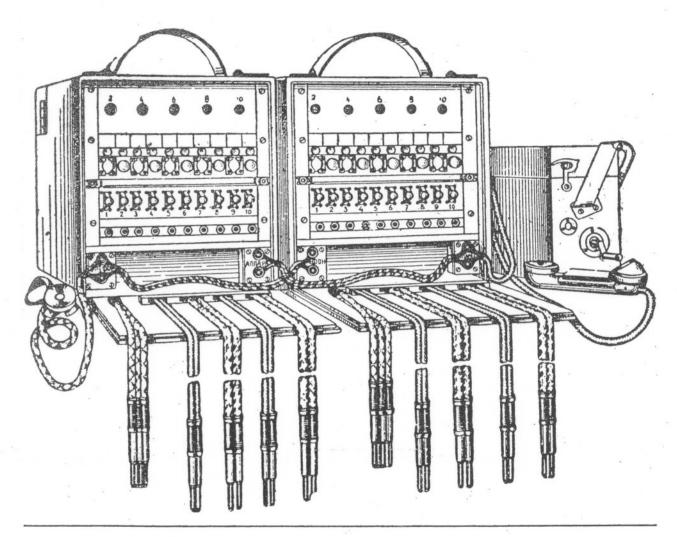


CHARACTERISTICS

I.	PHYSICAL DATA:		
	Unit	Size	Weight
	PK-30	24" x 18" x 24.6"	176 lbs.
II.	TECHNICAL CHARACTER	ISTICS:	
	Number of lines	Local battery 25 lines Phonetic 3 lines Common battery 2 lines	
	Type of signaling	Local battery; 25 line drops Phonetic; 3 phonetic rece lights	eivers and
		Common battery; 2 line dro	ps
	Connections		
-	Auxiliary equipment		
	Conference calls Identifying feature		

Field Switchboard Type PK-10

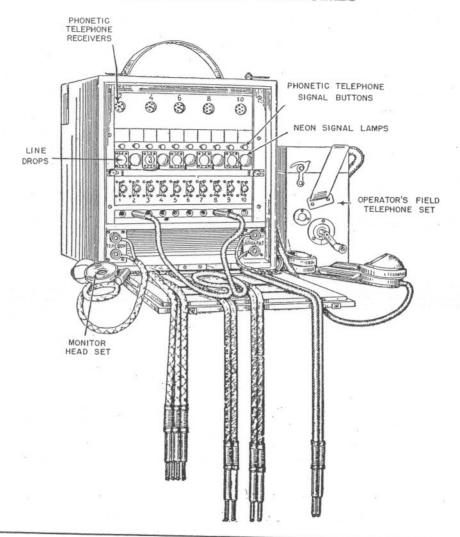
КОММУТАТОР ТИП ПК-10



The Soviet Switchboard PK-10 is a field telephone switchboard used by headquarters of a battalion, regiment, and Division. It has 10 lines, 5 are magneto operated and 5 are phonetically operated. Two similar sets may be grouped to provide for 20 subscribers.

A UNA-FI field telephone is required for answering calls by the operator and signaling. A special cord permits a conference between four parties on called magneto lines. Double plugged cords permit completion of five calls.

Field Switchboard Type PK-10 RECOGNITION FEATURES



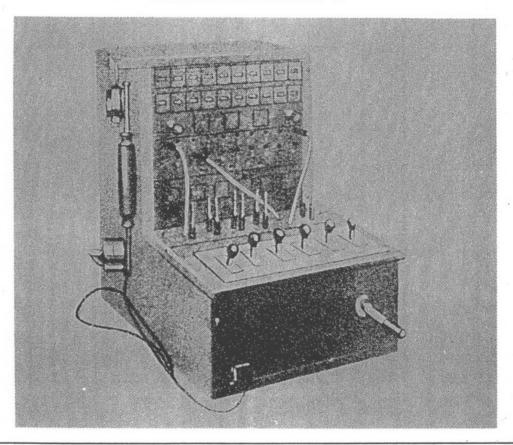
CHARACTERISTICS

I. PHYSICAL DATA:

	Unit	Size	Weight
n.	PK-10 TECHNICAL CHARACTER	ISTICS:	27.5 lbs.
	Number of lines	5 magneto 5 phonetic	
	Type of signaling Connections	Magneto and phonetic Cords	
	Conference call	4 parties Operator's telephone	
	Auxiliary equipment	Operator's field telephone Ul	VA-FI

Field Switchboard Type R-20

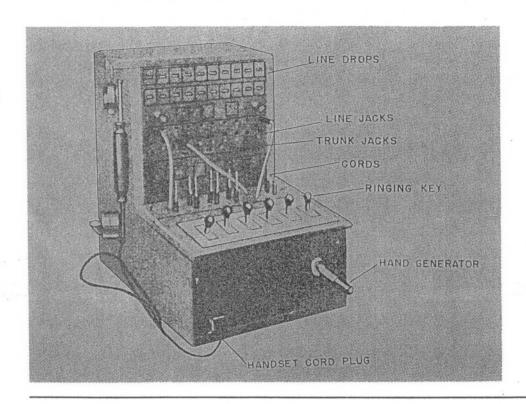
ТИП КОММУТАТОРА Р-20



The R-20 switchboard is a single position, non-multiple, field magneto type switchboard used at Division Level and above. It can accommodate 20 magneto type telephone lines, and 2 lines for connection to automatic dial equipment. By means of cords a maximum of six connections may be made simultaneously. Conference calls for five parties are possible.

The operator is unable to monitor conversations. The R-20 switchboard requires a three man-crew for normal, quick installation. The R-20 is the predecessor of the R-20-M. It is possible that the switchboard packs into a base cabinet for transport similar to the Soviet Switchboard R-20-M.

Field Switchboard Type R-20 RECOGNITION FEATURES



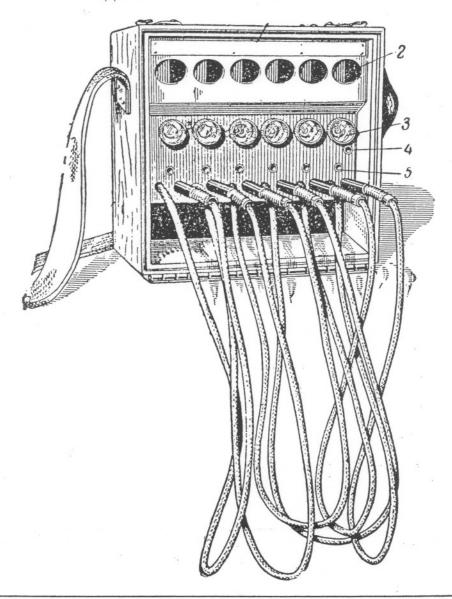
CHARACTERISTICS

I. PHYSICAL DATA:

Unit	Size	Weight
R-20	20.7" x 19.5" x 14.2"	70.8 lbs.
II. TECHNICAL CHARACTER	ISTICS:	
Number of lines	20 local magneto lines	
	2 automatic dial equipment lin	es ·
Type of signaling	20 drops (magneto)	
Connections	6 pairs of cords	
Conference call	Yes, up to 5 parties	
Power supply	6 v battery-hand magneto	
Anviliary againment	Toot Sat DD 1	

Field Switchboard Type FIN-6

ФОНОИНДУКТОРНЫЙ КОММҮТАТОР ТИП ФИН-6

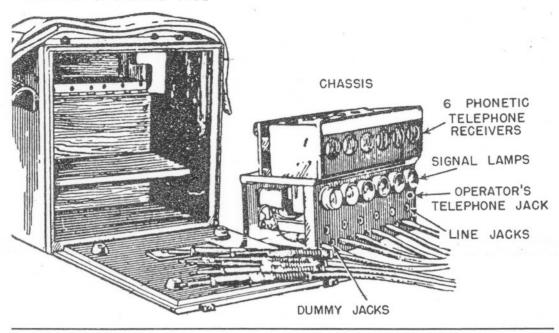


The Soviet six-line switchboard, type FIN-6, is primarily used for communications in the infantry battalions, artillery battalions, and artillery batteries.

The capacity of working lines may be increased by using two or even three switchboards at the same time. No interconnecting lines are necessary between two or three boards when used together.

Field Switchboard Type FIN-6 RECOGNITION FEATURES

CARRYING & STORING CASE

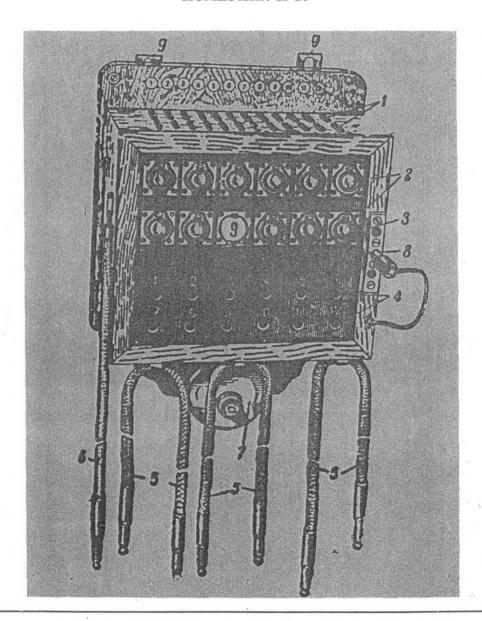


CHARACTERISTICS

I. PHYSICAL DATA:		
Unit	Size	Weight
FIN-6	9.5" x 9" x 5.5"	10 lbs
II. TECHNICAL CHARACTERIS	STICS:	
Number of lines	Local battery, 6 lines	
Type of signaling	Signal lamps and piezo-elec- ers (requiring constant m	
Connection,	Cords	
Auxiliary equipment	Field telephone set	
Conference call	Yes	

Switchboard "Nomernik" N-20

НОМЕРНИК Н-20

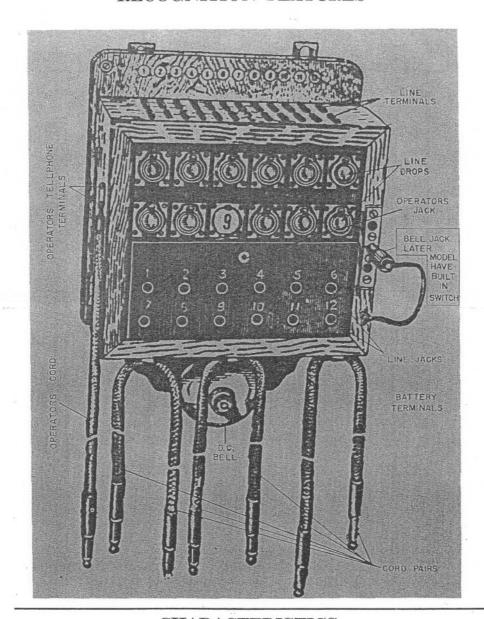


The Switchboard "Nomernik" resembles a trunk switchboard; however, it is designed for local subscriber service. The "Nomernik" is wall mounted and can accommodate 12 subscribers. It can be used only with magneto type phones. The number of simultaneous connections

are limited to the supplied three sets of cords. A field telephone is required to complete calls and supply the magneto for signaling.

This switchboard is no longer manufactured or used extensively, but may be encountered in the field at command posts, airdromes, or depots.

Switchboard Type "Nomernik" N-20 RECOGNITION FEATURES

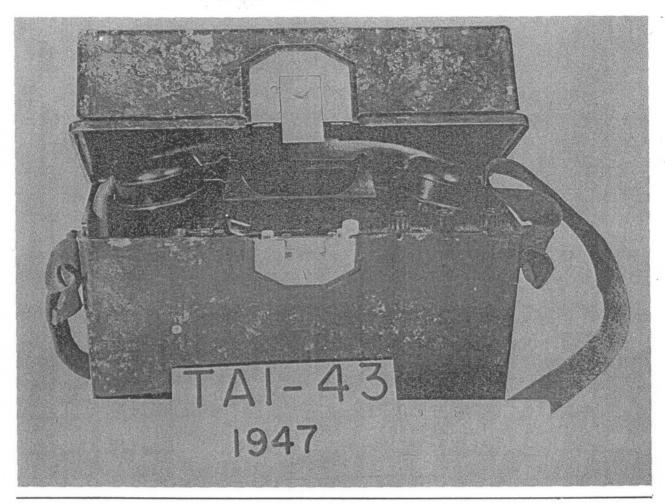


CHARACTERISTICS

I. PHYSICAL DATA:		
Unit	Size	Weight
"Nomernik" II. TECHNICAL CHARACTER	ISTICS:	8.8 lbs.
Number of lines	12 magneto	
Type of signaling		
Connections	3 simultaneous with cords su	pplied
Power supply	Operator's field telephone	
Auxiliary equipment	Operator's field telephone s magneto type.	set of the

Field Telephone Type TAI-43

ПОЛЕВОЙ ТЕЛЕФОН ТИП ТАИ-43

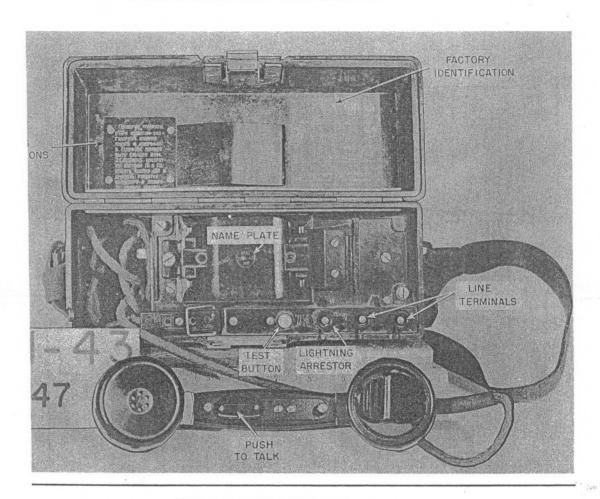


The TAI-43 is a field telephone designed for telephone requirements from corps to lower echelons of the Soviet Army. The set may be used both for communications and monitoring. Soviets claim that the maximum distance of voice communication over field wire is approximately 15 miles, but United States analysis show that with the use of a 1½-volt battery, the dependable range under normal weather conditions is approximately

5 miles, with the signal level deteriorating appreciably beyond this point.

The TAI-43 was produced in a wooden box from 1943 until 1944, but has since been turned out in a plastic (ebonite) box. This set is reputed to be the best Soviet made field telephone, and is replacing all other field telephones in the Soviet Army.

Field Telephone Type TAI-43 RECOGNITION FEATURES

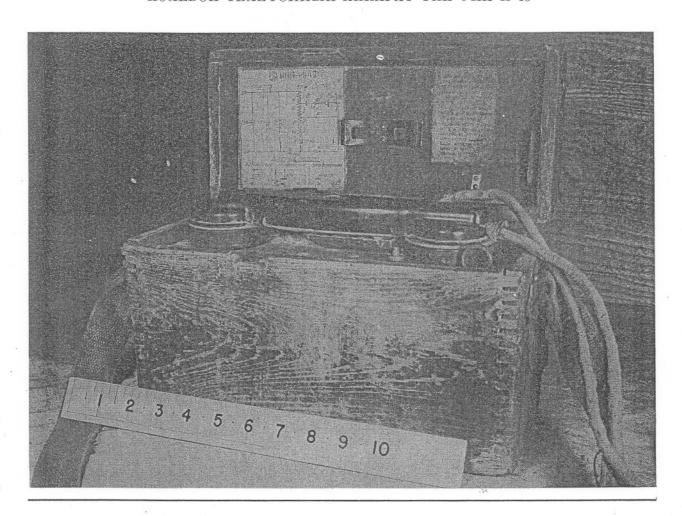


CHARACTERISTICS

I. PHYSICAL DATA:		
Unit	Size	Weight
TAI-43	. 11" x 9" x 4"	11 lbs.
II. TECHNICAL CHARACTERIS	STICS:	
Class	Field telephone	
Туре]	Local battery	
Signaling	Magneto and bell	
Operating distance	miles	
Battery1	.5-volt dry cell	

Field Telephone Type UNA-I-43

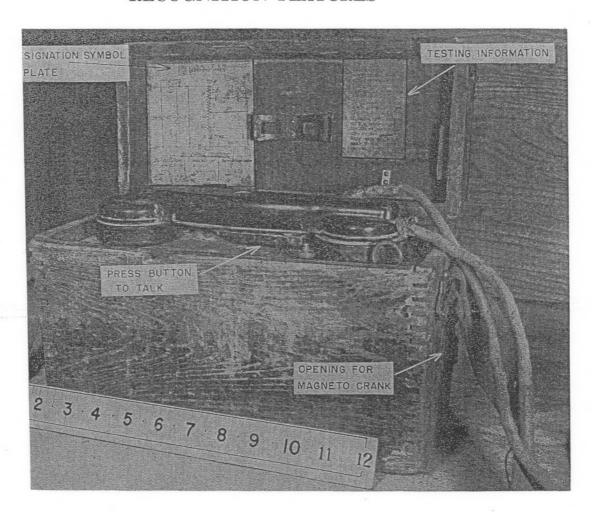
ПОЛЕВОЙ ТЕЛЕФОННЫЙ АППАРАТ ТИП УНА-И-43



The UNA-I-43 is a field telephone housed in a wooden case and painted OD. The hinged lid of the box is reinforced on the back side by straps and is held tight, when closed, by two hinged hooks. The set is transported by means of a

strap attached to the ends of the case. The induction coil has a good electromagnetic quality and a modern hand set is provided with the telephone.

Field Telephone Type UNA-I-43 RECOGNITION FEATURES

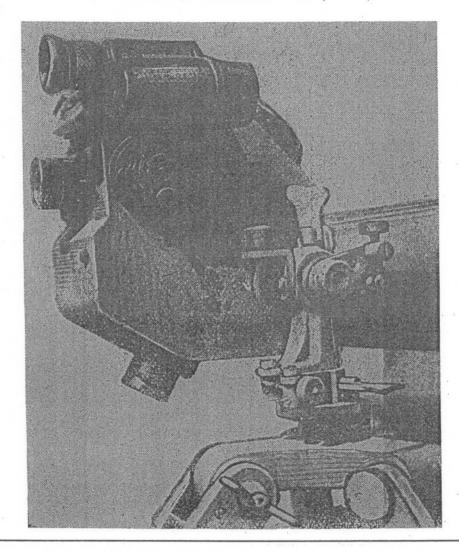


CHARACTERISTICS

I. PHYSICAL DATA:	
Unit	Size Weight
UNA-I-43	113/8" x 5" x 75/8" 7 lbs.
II. TECHNICAL CHARACTERI	STICS:
Class	Field telephone
Туре	Local battery
Signaling	Voice
Operating Distance	Field wire 12 miles, permanent open wire 90 miles
Dattown	2 malt days call

Photophone Type (1935 Model)

ОПТИЧЕСКИЙ ТЕЛЕФОН ТИП (? 1935)



This photophone of unknown type number is a two-man pack set operated by self-contained batteries. It is normally used between command posts. It is known to operate on infrared radiation and may operate on visible light as well. Its range is 5 miles line of sight. This type of equipment differs from signal lamps and blinkers, in that the beam is actually modulated by telephone voice currents and that the voice currents are detected again at the receiving end. In this way communication is similar to radio-telephone. The beam is very directional and can be received only

by careful alinement. This set may be identical to U. S. S. R. photophone "Zeiss 130", and was developed from Zeiss equipment. A canvas bag is provided for the tripod. The basic transmitter-receiver unit with light source, modulator, photocell and lens systems are mounted on a tripod. For transport the basic unit is packed in a case with the amplifier's high potential dry batteries; a second case contains the amplifier's filament battery and accessories.

Photophone Type (1935 Model) RECOGNITION FEATURES

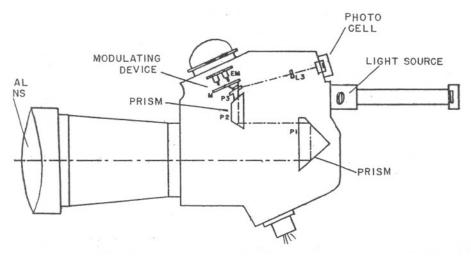


FIGURE 7. OPTICAL RECEIVER

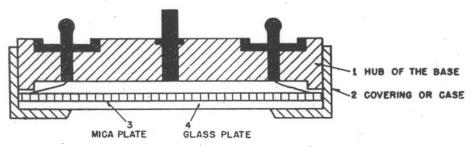


FIGURE 8. CROSS SECTION OF PHOTOELECTRIC CELL

I. PHYSICAL DATA:

CHARACTERISTICS

Unit Weight Transmitter-receiver case_____ Tripod, packed..... II. TECHNICAL CHARACTERISTICS: Light range..... Infrared light, possibly visible light Type of modulation Intensity or amplitude

Range 5 miles approximately, line of sight only Power source Filament; storage battery

"B" supply; dry batteries

Tubes 4 or 5 tubes, types unknown

Field Telephone Type UNA-I-31

ПОЛЕВОЙ ТЕЛЕФОННЫЙ АППАРАТ ТИП УНА-И-31



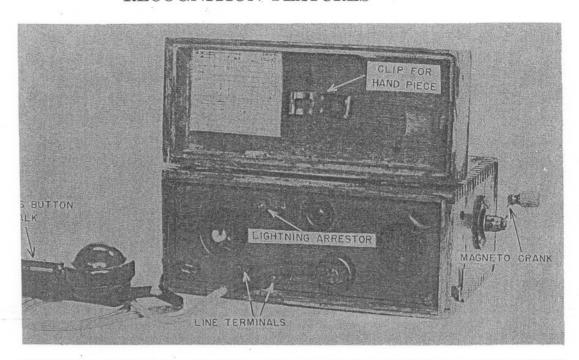
The UNA-I-31 is a field telephone housed in a wooden box with a carrying strap. This set is used throughout the Soviet Army; from Army, down through lower echelons. It is an improvement over the UNA-I-28, with a transformer of

much better electromagnetic qualities, a more modern handset, a stronger magneto and a more sensitive ringing circuit. In many other respects, the UNA-I-31 corresponds to the UNA-I-28. The set was first manufactured in 1931.

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Field Telephone Type UNA-I-31 RECOGNITION FEATURES

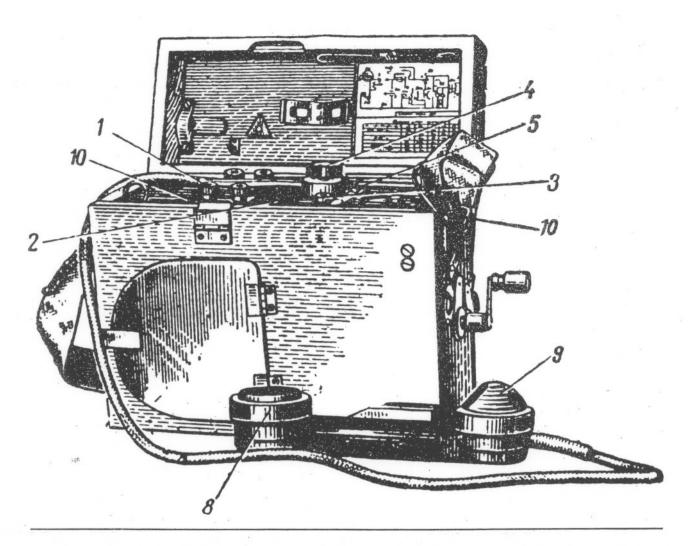


CHARACTERISTICS

I. PHYSICAL DATA:		
Unit	Size	Weight
UNA-I-31	11.2" x 9.3" x 4.5"	12½ lbs.
II. TECHNICAL CHARACTERIS	TICS:	
ClassF	'ield telephone	
Туре І	ocal battery	
Signaling M	Agneto	
Operating distance R	tubber field cable line,	13 miles
Т	'elegraph, cable 30 miles nent field lines, 75 miles	s. Perma-
Battery 3	-volt dry cell	

Field Telephone Type UNA-FI

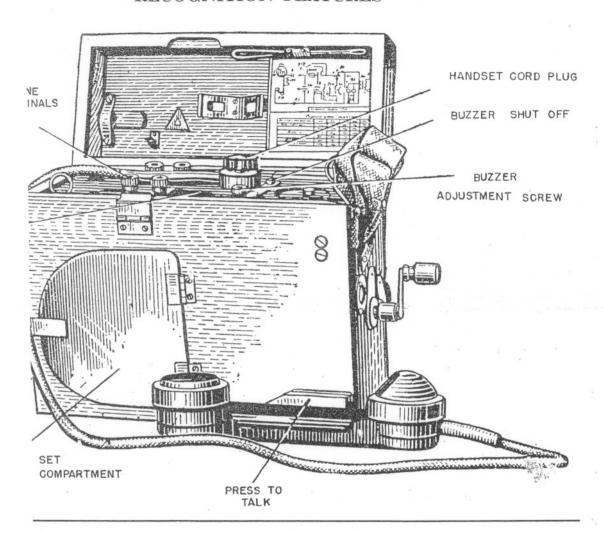
полевой телефон тип уна-фи



The UNA-FI is a field telephone used throughout all echelons of the Soviet Army. The UNA-FI contains the elements of the UNA-F (phonetic signaling) and the UNA-I (magneto signaling), thus permitting its use with either type. When

used by higher headquarters, a dial attachment is available permitting further use with an automatic dial exchange system. It is housed in a wooden box which has an attached strap.

Field Telephone Type UNA-FI RECOGNITION FEATURES



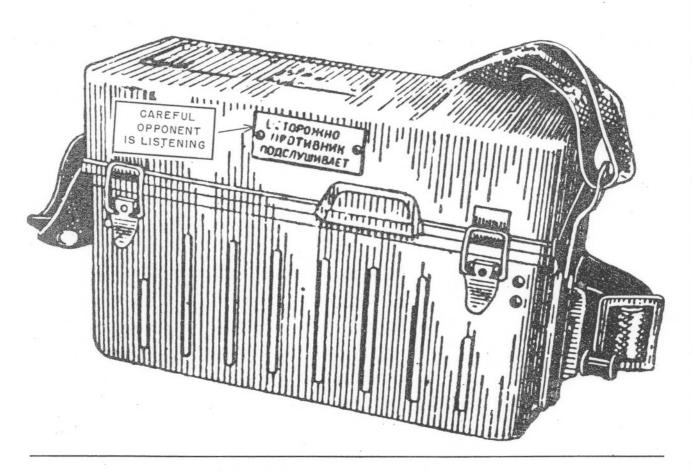
CHARACTERISTICS

I. PHYSICAL DATA:

Unit	Size Weight
UNA-FI	11" x 4" x 9" 16½ lbs.
II. TECHNICAL CHARACTER	ISTICS:
Class	Field telephone
Type	Local battery
Signaling	Buzzer and magneto
Operating distance	Field wire, 15 miles; telegraph cable, 40 miles; overhead line-permanent, 160 miles.
Battery	Hand generator—battery

Field Telephpne Set Type TABIP

ТЕЛЕФОННЫЙ АППАРАТ ТИП ТАБИП

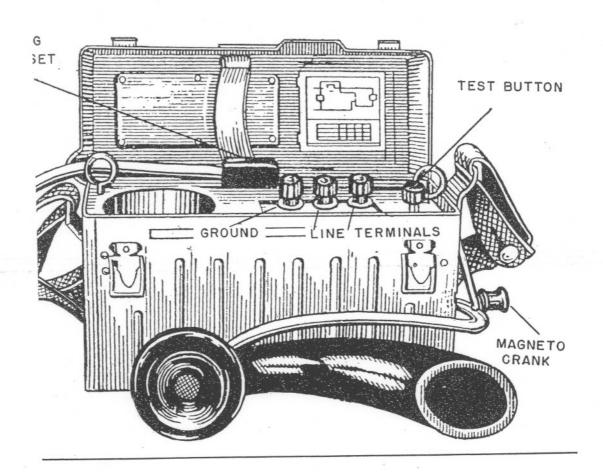


The TABIP is a field telephone. The set is a sound-power telephone mounted in a duraluminum box and is used by companies and frontline elements. The receiver element serves also as microphone. The handle of the handset is funnel shaped to serve as a mouthpiece. The buzzer device is mechanical and is located on the edge

of the receiver element. The buzzer signal is sent or received like speech through the receiver. Two models of this phone are known to have been used tactically by the Soviets as early as 1941—these are the TABIP-1 and the TABIP-2. The illustration and data are accepted as that of the TABIP-1.

Field Telephone Type TABIP RECOGNITION FEATURES

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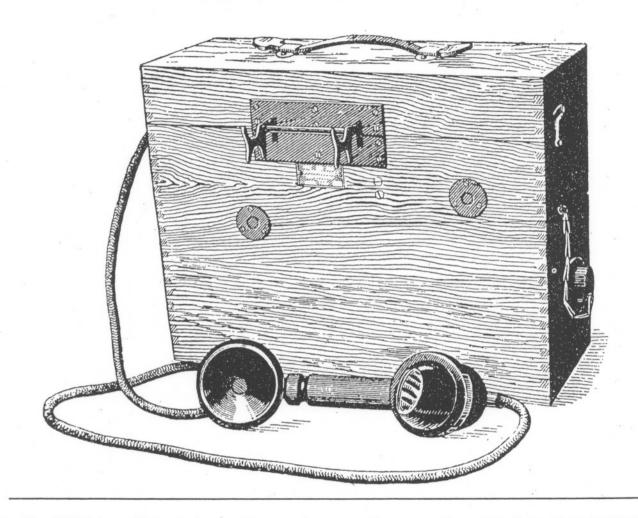


CHARACTERISTICS

I. PHYSICAL DATA:		
Unit	Size	Weight
TABIP	10" x 4" x 6"	8.8 lbs.
II, TECHNICAL CHARACTER	ISTICS:	
Class	Field telephone	
TypeSignalingOperating distance	Field cable lines 8 miles, tele 20 miles	graph wire
Battery	Sound-Powered	

Field Telephone Type TAM

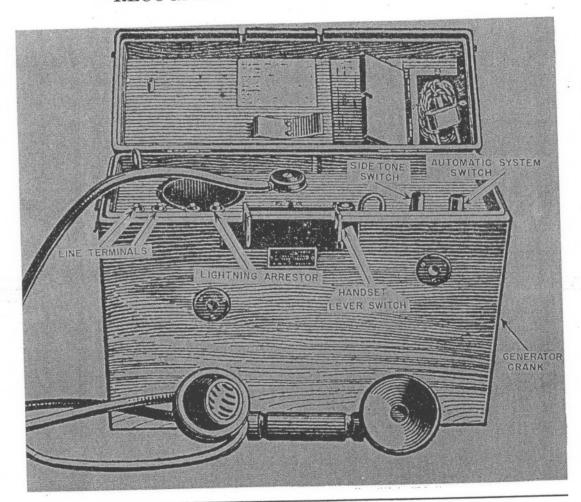
полевой телефон тип там



The TAM is a field telephone. The set is equipped for local or central battery operation (Switch 1). It contains a differential-microphone for greater operating range. The elements (mag-

neto, buzzer, etc.) are like those of the UNA-F and UNA-I sets. It is usually employed at higher staff level. The set has a wood housing.

Field Telephone Type TAM RECOGNITION FEATURES

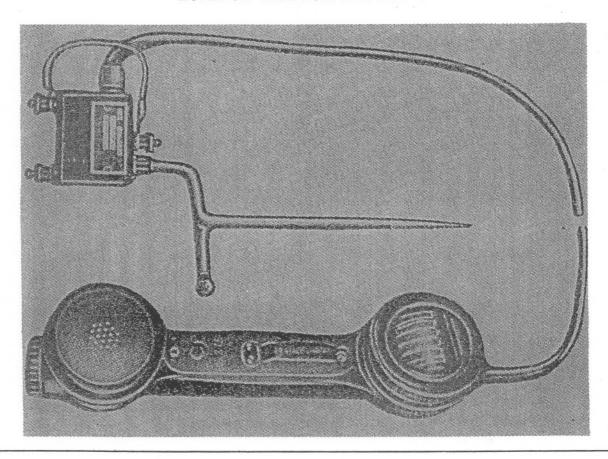


CHARACTERISTICS

I. PHYSICAL DATA:	
Unit	Size Weight 14" x 8.5" x 5.3" 16½ lbs.
II. TECHNICAL CHARACTERI Class Type Signaling Operating distance	STICS: Field Telephone Common battery Buzzer and inductor Field cable, 15 miles; ground return, 45 miles; overhead lines, 175 miles
Battery	Hand generator or common battery, 6-volt battery

Field Telephone Type TAT-F

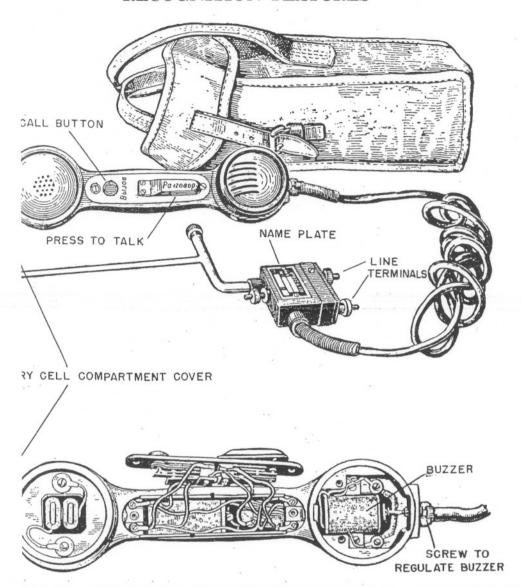
полевой телефон тип тат-ф



The TAT-F is a field telephone. It is a light, compact, rugged set used by Soviet paratroops, and built for use with a ground return circuit in addition to normal metallic circuits. It consists of a hand set, a small protective line, connection box with attached ground stake, and carrying

cage. All elements except the lightning arrester are located in the hand set. The lightning arrester is in a separate box which contains the connecting terminals. This set is adequate for the tactical purposes for which it is designed.

Field Telephone Type TAT-F RECOGNITION FEATURES

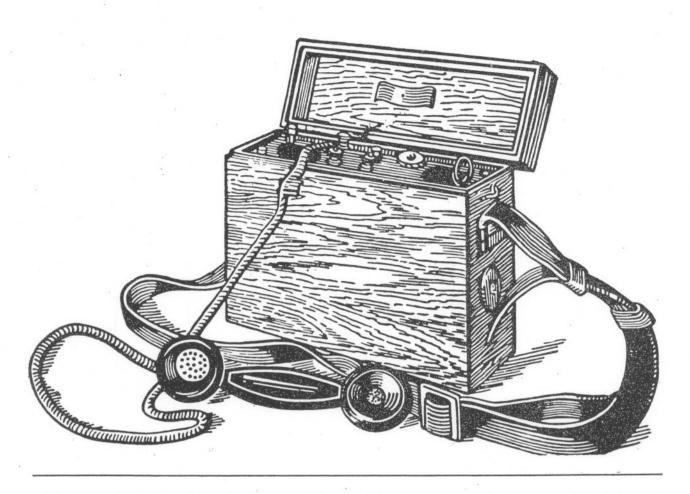


CHARACTERISTICS

I. PHYSICAL DATA:	
Unit	Size Weight
TAT-F	3" x 4" x 11"
II. TECHNICAL CHARACTER	ISTICS:
Class	Field telephone
Туре	Local battery
Signaling	Buzzer
Operating distance	Field cable, 7 miles; ground return, 25 miles; permanent field lines, 100 miles
Battery	Flashlight cell

Field Telephone Set Type UNA-F-31

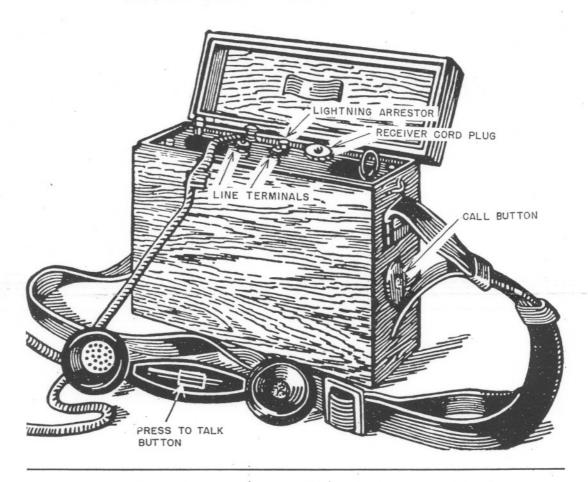
ПОЛЕВОЙ ТЕЛЕФОННЫЙ АППАРАТ ТИП УНА-Ф-31



The UNA-F-31 is a field telephone used by signal elements from division down through company. The set is fitted in a wooden box. Through the use of condensers, it can be used on telegraph lines for voice communications simultaneously

with telegraph. Calling is accomplished through the use of a buzzer. The buzzer may be used as a telegraph key and thus the set takes the place of a small portable telegraph set. The UNA-F-31 is a development of the UNA-F-28.

Field Telephone Type UNA-F-31 RECOGNITION FEATURES



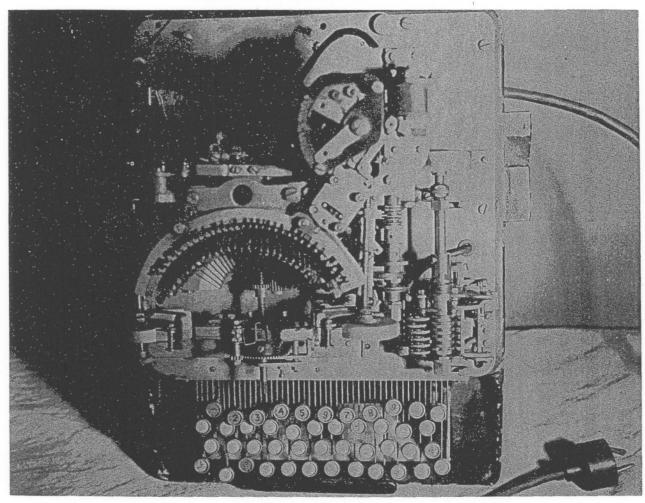
CHARACTERISTICS

I. PHYSICAL DATA:

Unit	Size	Weight
UNA-F-31	11.1" x 9.36" x 3.9"	7½ lbs.
II. TECHNICAL CHARACTER	ISTICS:	
Class	Field telephone set	
Туре	Local battery	
Signaling	Buzzer	
Operating distance	miles; pole lines, 60 miles;	
Battery	66 miles.	

Teletypewriter Set Type ST-35

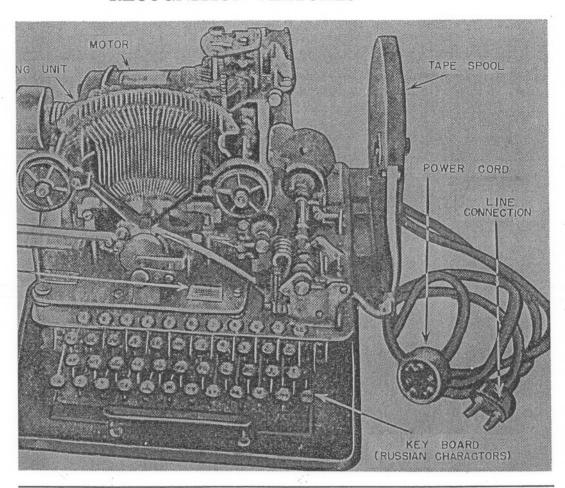
ТЕЛЕГРАФНЫЙ АППАРАТ ТИП СТ-35



The teleprinter ST-35 is used in division and higher echelons. It is a tape style teletypewriter-printer with manual keyboard. The parts are interchangeable with United States Model 14 teletype except for the motor keys, and the type bar

pallets. Soviet machines can be used on United States circuits for transmission of Russian language material. These sets have also been found with Korean characters.

Teletypewriter Set Type ST-35 RECOGNITION FEATURES

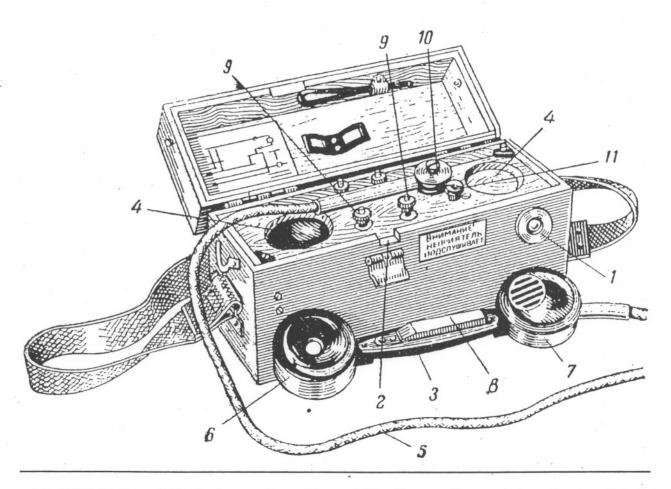


CHARACTERISTICS

I. PHYSICAL DATA:		
Unit	Size	Weight
ST-35		88 lbs.
II. TECHNICAL CHARACTER	ISTICS:	
Type	Tape printer with Russian characters	
Signal	Type; neutral	
	Mark; 60 ma	
	Space; 0 ma	
Speed	60 words per minute (360 operations)	
Character	7 impulses, 163 milleseconds	
Motor	Governed universal a. cd. o	. motor

Field Telephone Set Type UNA-F-42

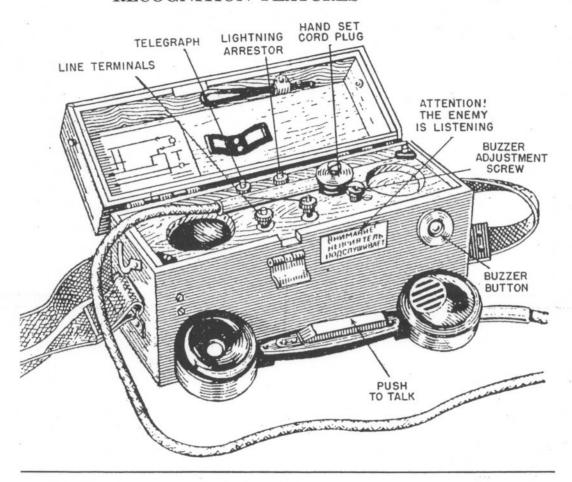
ПОЛЕВОЙ ТЕЛЕФОННЫЙ АППАРАТ ТИП УНА-Ф-42



The UNA-F-42 is a field telephone. The set is used from corps down through lower echelons of the Soviet Army. The set is contained in a wooden box which is colored OD Two models

of this phone are known to have been used tactically by the Soviets—the UNA-F-42 and the UNA-F-43. The illustration and data are accepted as that of the UNA-F-42.

Field Telephone Set Type UNA-F-42 RECOGNITION FEATURES



CHARACTERISTICS

I. PHYSICAL DATA		
Unit	Size	Weight
UNA-F-42	8" x 4" x 6"	7½ lbs.
II. TECHNICAL CHARACTER	ISTICS:	
Class	Field telephone	
Туре	Local battery	
Signaling	Magneto	
Range	Field telephone wire-8-12 n	niles
	Ground return-15 to 25 miles	
	Overhead lines-60 to 75 mil	es
Battery	Dry battery	