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TM 11-487B

DEPARTMENT OF THE ARMY TECHNICAL MANUAL



DIRECTORY OF SIGNAL CORPS
EQUIPMENTS
WIRE COMMUNICATION
EQUIPMENT

DEPARTMENT OF THE ARMY • MARCH 1951



DEPARTMENT OF THE ARMY TECHNICAL MANUAL
TM 11-487B

This manual supersedes so much of TM 11-487, 2 October 1944, as pertains to Wire Communication Equipment

DIRECTORY OF
SIGNAL CORPS EQUIPMENTS
WIRE
COMMUNICATION EQUIPMENT



DEPARTMENT OF THE ARMY

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FOREWORD

This is the second of a series of nine separate manuals, each covering the standard, substitute standard, and limited standard Signal Corps equipments in a particular field. The nine manuals cover, respectively, radio communication equipment, wire communication equipment, ground radar and recognition equipment, radio direction finding equipment, power equipment, photographic equipment, meteorological equipment, test equipment, and sound, light, and miscellaneous equipment.

The material in this manual is arranged in two chapters. Chapter 1 lists the principal items of wire equipment (including cable assemblies and terminal boxes) by nomenclature type numbers in alpha-numerical sequence. An illustration and the following information, as applicable, are given for each item of equipment: nomenclature, status, Signal Corps stock number, technical literature, description, technical characteristics, application, principal components, and weight and volume. Chapter 2 lists data on bulk wire and cables and cable terminals in tabulated form, with the following information, as applicable, given for each item: nomenclature, status, Signal Corps stock number, description, and technical characteristics.

The nomenclature type names of all the equipments are listed alphabetically in the index, and the nomenclature type numbers are listed alpha-numerically in the contents.

The following abbreviations are used in this manual:

ac.....	alternating current	Limited/Std....	Limited Standard
amp.....	ampere	MDF.....	Main Distributing Frame
amp-hr.....	ampere-hour	m.....	meter
am.....	amplitude modulated	ma.....	milliampere
avg.....	average	max.....	maximum
AWG.....	American Wire Gage	mh.....	millihenry
cf.....	carrier frequency	mi.....	mile
cfm.....	cubic feet per minute	min.....	minimum
cps.....	cycles per second	mpg.....	miles per gallon
cu ft.....	cubic foot	mph.....	miles per hour
cyc.....	cycles	mw.....	milliwatt
db.....	decibel	OD.....	outside diameter
dbm.....	decibels relative to 1 milliwatt	opm.....	operations per minute
dc.....	direct current	parl-pr.....	parallel-pair
diam.....	diameter	pf.....	power factor
ea.....	each	pr.....	pair
fm.....	frequency modulated	qt.....	quart
ft.....	feet	rpm.....	revolutions per minute
gal.....	gallon	SAE.....	Society of Automotive Engineers
h.....	high	Substitute/Std..	Substitute Standard
hr.....	hour	twst-pr.....	twisted-pair
in.....	inch	v.....	volt
kc.....	kilocycle	va.....	volt-ampere
kva.....	kilovolt-ampere	vf.....	voice frequency
kw.....	kilowatt	w.....	watt
lb.....	pound	yd.....	yard
lf.....	low frequency		

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CHAPTER 1

PRINCIPAL ITEMS OF WIRE EQUIPMENT

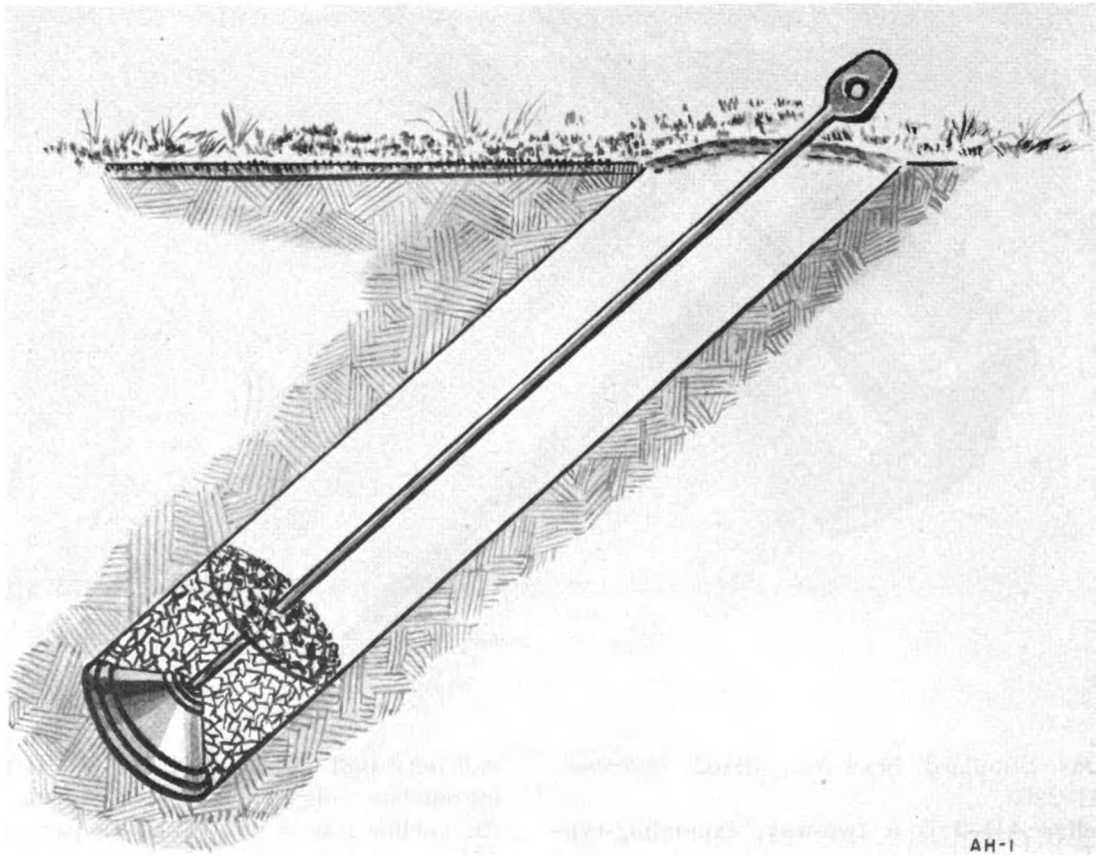


Figure 1. Anchor AH-1.

Status: Standard. *Stock No.:* 5B101. *Reference:* TM 11-2263.

Anchor AH-1 is a cone-shaped, cast-iron anchor 8 inches in diameter with a $\frac{7}{8}$ -inch hole for use with $\frac{1}{2}$ -inch, $\frac{5}{8}$ -inch, or $\frac{3}{4}$ -inch anchor rods. It is used as a guy anchor in the construction of open wire telephone lines. The AH-1 is designed for use when soil conditions are such that stones of

the proper size for refilling the hole are removed in making the excavation for the anchor. An anchor rod is not issued as part of Anchor AH-1.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	5.3	6.5
Total volume (cu ft).....	.05	.05

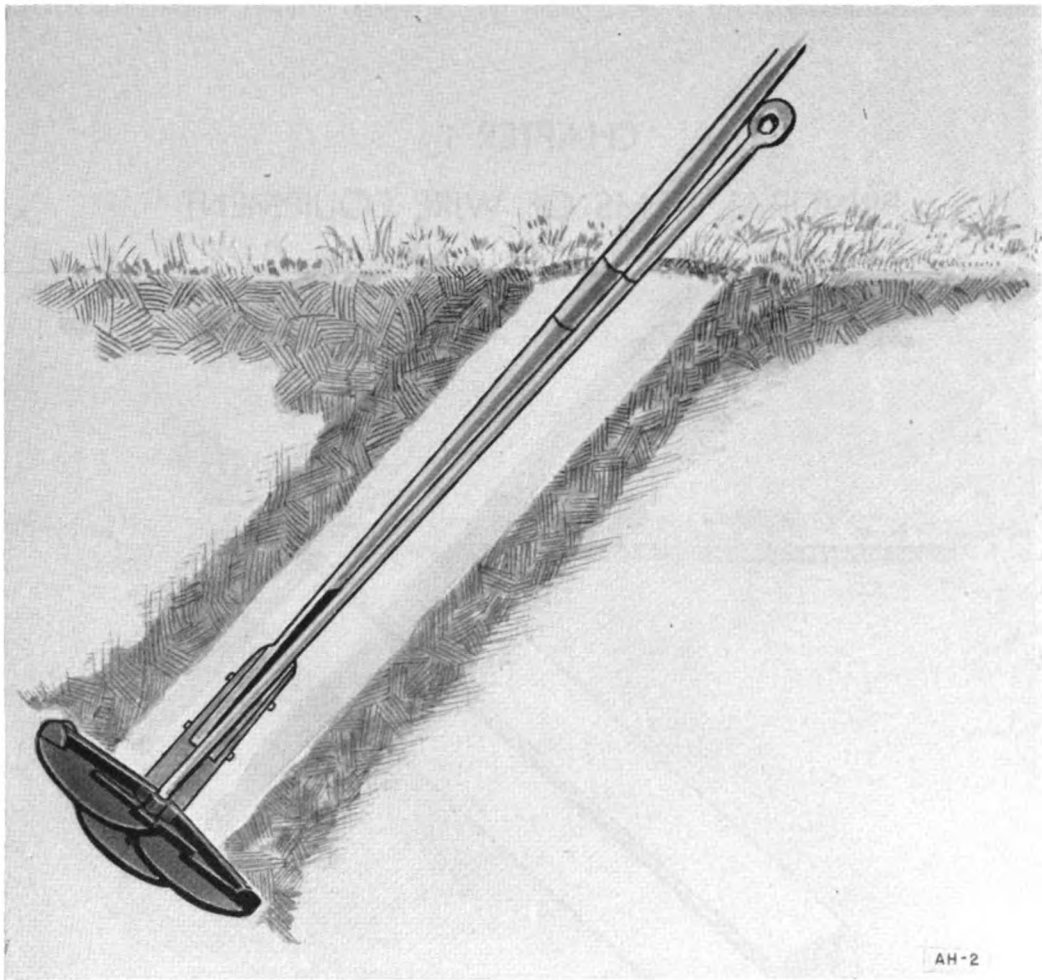


Figure 2. Anchor AH-2.

Status: Standard. *Stock No.:* 5B102. *Reference:* TM 11-2263.

Anchor AH-2 is a two-way, expanding-type anchor 8 inches in diameter when closed and 8 inches by 15 inches when open. It is used as a guy anchor in the construction of open wire or aerial cable telephone lines. The AH-2 is designed for use when average soil conditions pre-

vail for a pull up to 6,000 pounds. It is suitable for anchor rods of from $\frac{1}{2}$ - to $\frac{3}{4}$ -inch diameter. An anchor rod is not issued as part of Anchor AH-2.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	3.7	11.8
Total volume (cu ft).....	.02	.45



AH-5

Figure 3. Anchor Rod AH-5.

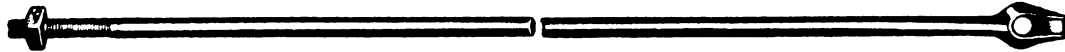
Status: Standard. *Stock No.:* 5B705.

Anchor Rod AH-5 is a galvanized iron bar three-eighths-inch in diameter and 5 feet long, equipped at one end with a plain eye, and at the other end with threads, a washer, and a nut. Anchor Rod AH-5 is used in the construction of

open wire or aerial cable telephone lines.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	3.5	5.2
Total volume (cu ft).....	.....	.....



AH-6-A

Figure 4. Anchor Rod AH-6-A.

Status: Standard. *Stock No.:* 5B706A.

Anchor Rod AH-6-A is a galvanized steel rod five-eighths-inch in diameter and 8 feet long. It is equipped at one end with a thimble-eye or guy-eye nine-sixteenths-inch wide and three-fourths-inch long, and at the other end with threads, a washer, and a nut. Anchor Rod

AH-6-A can be used with Anchor AH-1 or Anchor AH-2 in the construction of open wire or aerial cable telephone lines.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	8.9	11.6
Total volume (cu ft).....	.....	.29

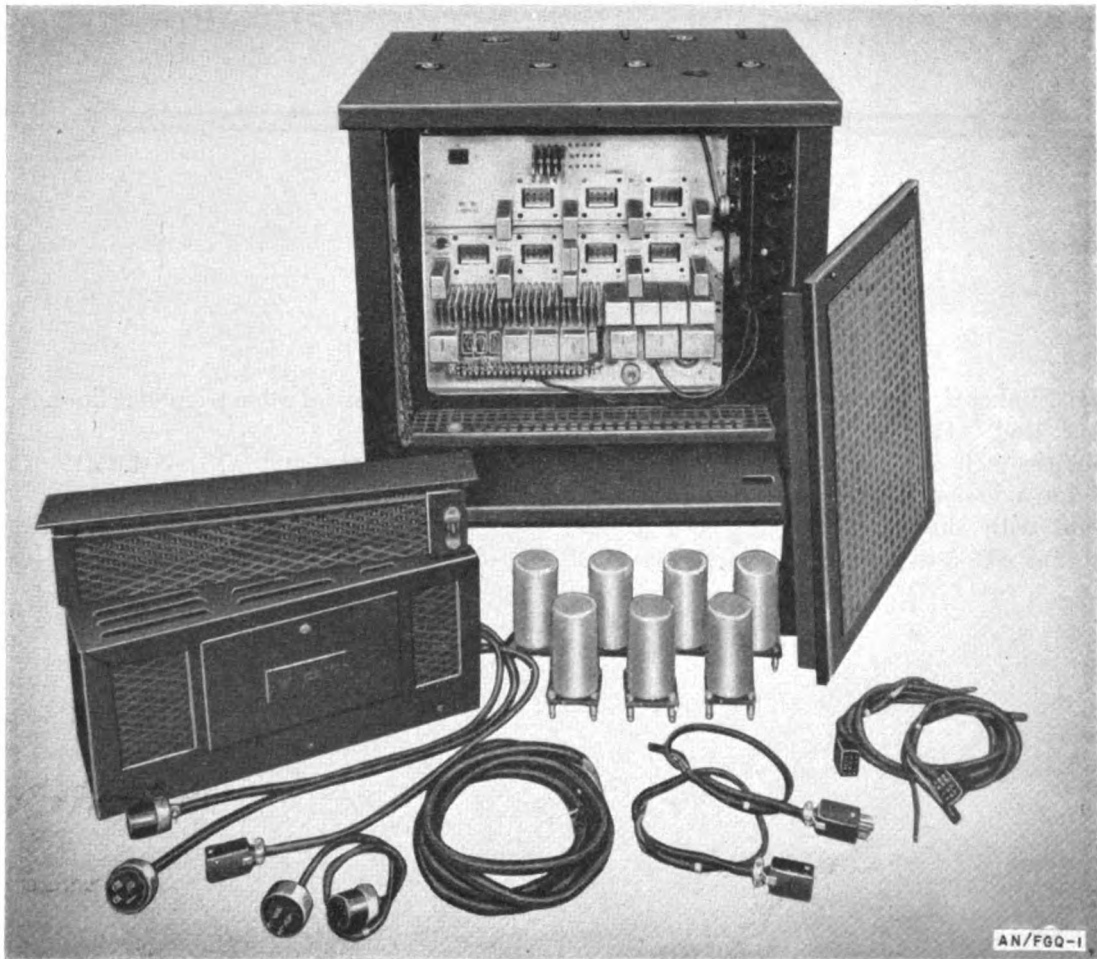


Figure 5. Teletypewriter Repeater-Mixer AN/FGQ-1.

Status: Standard. *Stock No.:* 4TW131-B2.
Reference: TM 11-2209.

Teletypewriter Repeater-Mixer AN/FGQ-1 is a two-way teletypewriter repeater and mixer equipment inclosed in a wooden table-type cabinet. It consists of a mixing relay unit, a repeater unit, a rectifier, and a control panel. The AN/FGQ-1 is used in conjunction with other teletypewriter equipment to provide a teletypewriter secrecy system.

Teletypewriter Repeater-Mixer AN/FGQ-1 is used in conjunction with Teletypewriter TT-10/FG or Teletypewriter Set AN/TGC-3 to increase the traffic handling capacity of wire or radio teletypewriter systems. The AN/FGQ-1 normally is used in large fixed-plant teletypewriter

systems of a communication zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral, telegraph, on a 20-, 30-, or 60-ma circuit.
POWER SUPPLY REQUIRED: 105/125 v dc or 95/125 v, 60 cyc ac.
NORMAL POWER CONSUMPTION: 400 w.
SPEED OF OPERATION: 60 speed (368 opm).
AUXILIARY EQUIPMENT: Universal connector.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	250	408
Total volume (cu ft)-----	11	29
Ship tons-----		.73

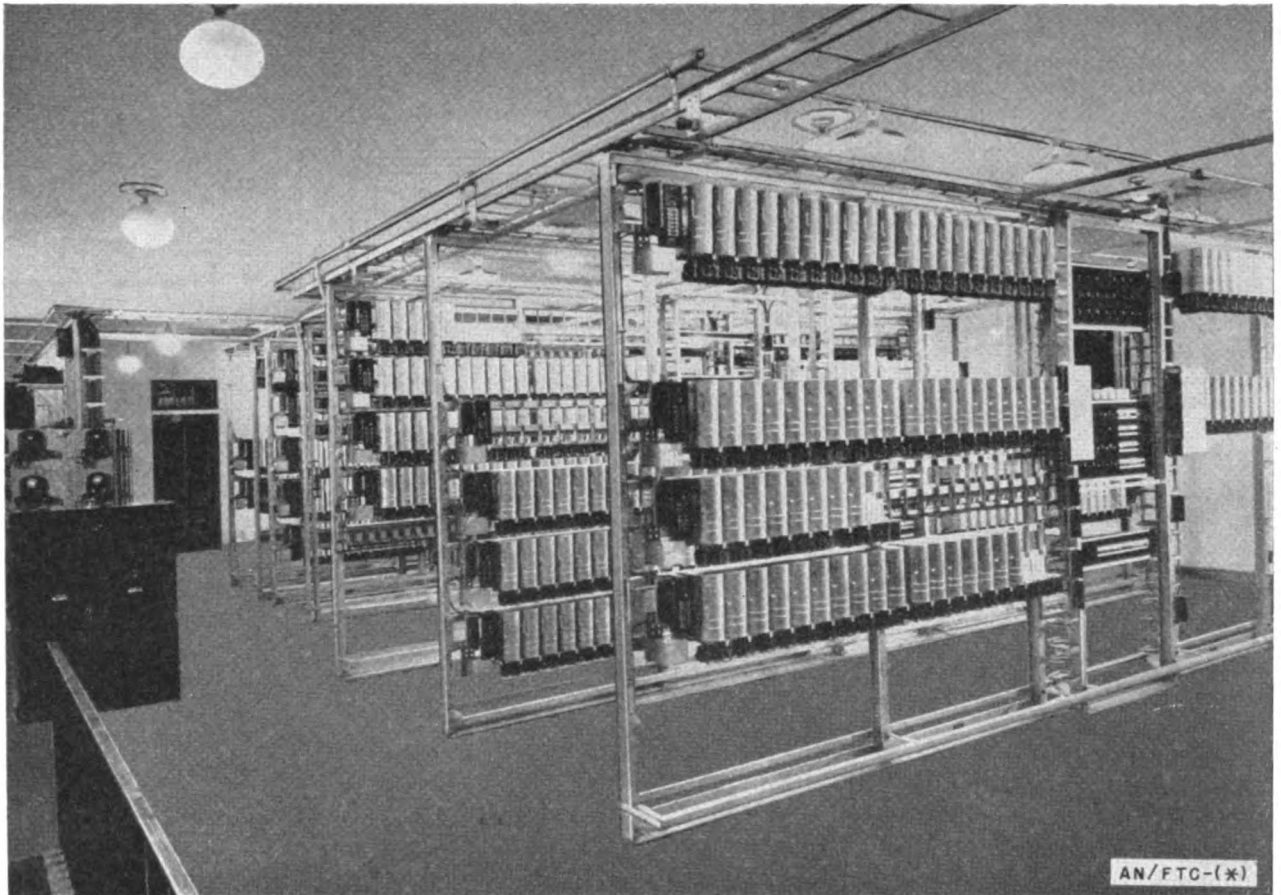


Figure 6. Typical Step-by-step Dial Central Office.

Status: Standard. *Reference:* TM 11-2100 series.

Telephone Central Office Set AN/FTC-(*) represents several procurements of automatic telephone central office equipment, each dependent upon different operating principles (Strowger step-by-step, all-relay, etc.), but all accomplishing the same result. Nomenclature has not been assigned specifically to any of the sets because of the complex problems involved.

Essentially, each set consists of a basis office of the 100- or 200-point system depending upon the number of lines desired. All of the basic offices may be expanded to greater size by the addition of more equipment, as illustrated in the following table:

<i>Basic office</i>	<i>Ultimate capacity</i>
400 lines	600 lines
600 lines	1,400 lines
1,400 lines	3,000 lines
3,000 lines	6,200 lines

Adequate provision is made for local battery lines, manual lines, two-way automatic trunks, information trunks, city trunks, test desk and test equipment, power supply, and all necessary accessory equipment. The size of any given installation is determined after a suitable survey of all of the elements involved in each individual problem. *At present, these equipments cannot be requisitioned directly.*

TECHNICAL CHARACTERISTICS

This feature is dependent upon the number of lines involved and the type of equipment. For complete details refer to the subject publications.

WEIGHTS AND VOLUMES

See technical characteristics.

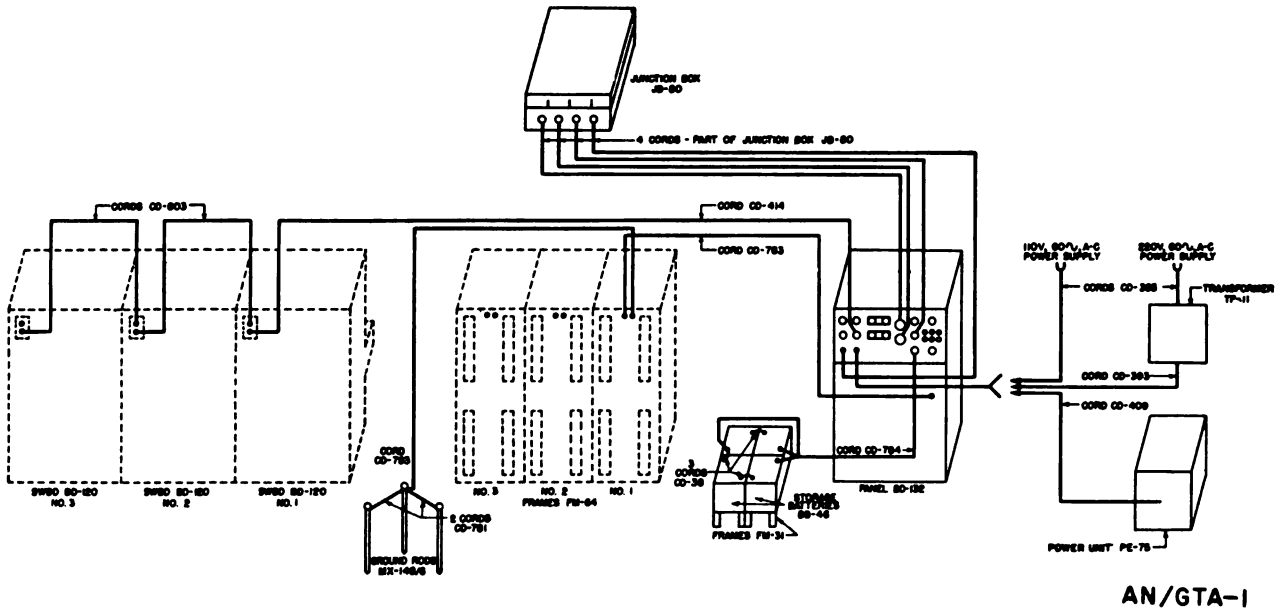


Figure 7. Auxiliary Telephone Central Equipment AN/GTA-1.

Status: Standard. Stock No.: 4C160-1.
 Auxiliary Telephone Central Equipment AN/GTA-1 is a complete set of supplemental equipment that permits establishing a separate telephone central office when Signal Corps Switchboard BD-80 or BD-110, with its associated Frame FM-19, can be borrowed from Signal Corps Telephone Central Office Set TC-1 or TC-10.

PRINCIPAL COMPONENTS

Component	Quantity
Battery BB-46	4
Tool Equipment TE-44	1
Transformer TF-11	1
Ground Rod MX-148/G	3
Power Unit PE-75-(*)	1
Junction Box JB-80	1
Rack FM-31	2
Frame FM-65	1
Frame FM-66	6

Component

Quantity

Rack FM-67	2
Rack FM-68	2
Rack FM-69	3
Panel BD-132	1
Cabinet BE-72	1
Cord CD-393	1
Cord CD-409	1
Cord CD-414	1
Cord CD-781	2
Cord CD-784	1
Cord CO-38	2
Case CS-63	4
Case CS-72	1
Case CS-124	1
Case CS-126	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	1,139	1,600
Total volume (cu ft)	40	56
Ship tons		1.4



Figure 8. Teletypewriter Set AN/PGC-1.

Status: Standard.

Teletypewriter Set AN/PGC-1 is a portable, lightweight, immersion proof teletypewriter set that can be man-packed into the forward combat areas. The AN/PGC-1 is used to send and receive teletypewriter code signals and to transcribe the signals in the form of page copy. The AN/PGC-1 is a complete unit that includes a teletypewriter, power unit, tools, and accessories.

Teletypewriter Set AN/PGC-1 is intended to be carried on regular quartermaster packboards. The AN/PGC-1 is used in the tactical teletypewriter nets of infantry divisions and regiments in the forward areas of the combat zone.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, 20- to 60-ma circuit.

POWER SUPPLY REQUIRED: From Engine Generator PU-181/PGC-1, 115 v ac, 60 cyc.
 SPEED OF OPERATION: 60 speed (368 opm).
 66 speed (404 opm).
 RANGE: Max, 25 mi of Wire W-110-B (wet) simplexed.

PRINCIPAL COMPONENTS

Component	Quantity
Teletypewriter TT-4/TG w/Case CY-694/PGC-1	1
Engine Generator PU-181/PGC-1, w/case	1
Accessories Case CY-553/PGC-1 w/Case CY-552/PGC-1	1

WEIGHT AND VOLUME

	Unpacked ¹	Export pack
Total weight (lb)	236	285
Total volume (cu ft)	11.9	19.5
Ship tons		.5

¹ Equipment in transportation chests.

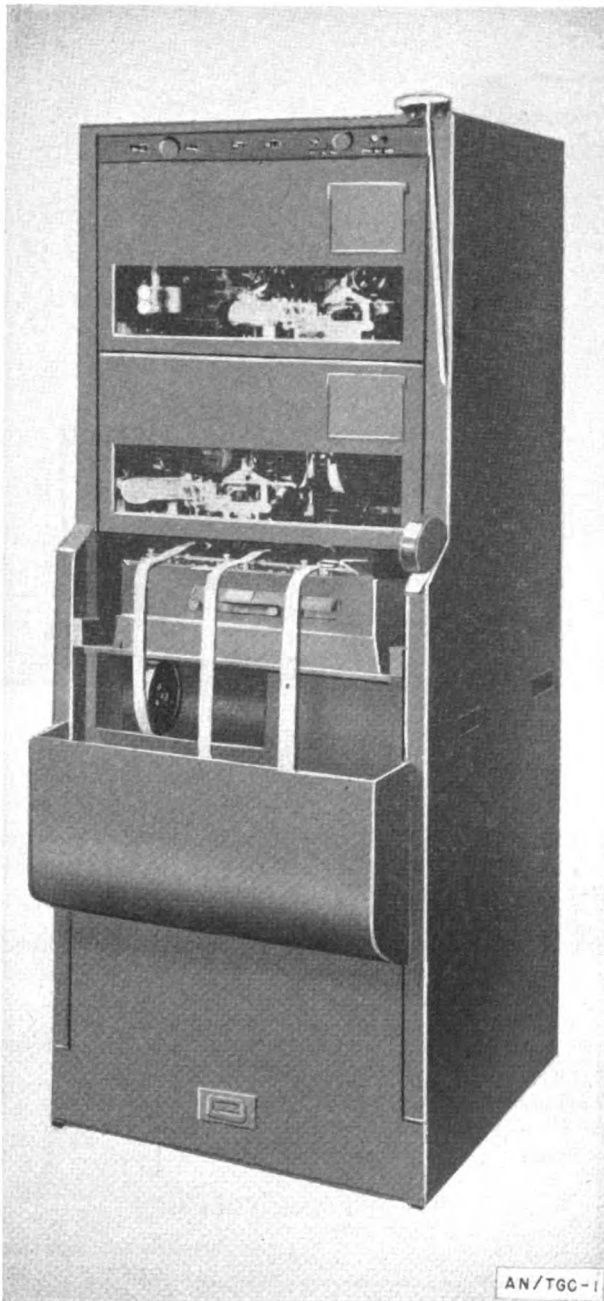


Figure 9. Teletypewriter Set AN/TGC-1.

Status: Standard. Stock No.: 4T1000-1. Reference: TM 11-2203.

Teletypewriter Set AN/TGC-1 is a combination of teletypewriter equipment housed in a metal console finished in light gray enamel. All

power and line connections are accessible from the front; the consoles may be set up side by side, back to back, or against a wall. The AN/TGC-1 includes multiple transmitter-distributor, typing reperforators, motor-driven tape winder, rectifier, tape feed-out feature, and necessary controls and alarms. The AN/TGC-1 receives messages in the form of electrical impulses and records the message in code perforations and typewritten form on paper tape. This tape can then be fed to a transmitter-distributor for retransmission to a line circuit or to a page printing teletypewriter.

Teletypewriter Set AN/TGC-1 speeds up the receiving, transmitting, or relaying of tape teletypewriter messages and normally is used on a single channel, duplex teletypewriter circuit. It may be used for split operation on two duplex circuits. The AN/TGC-1 is used in large fixed-plant, wire or radio, teletypewriter systems of a communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

OPERATION:

Type: Single or duplex.

Line: Neutral or polar, 5-unit code.

Speed: 60 wpm (368 opm).

POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac, or 110 to 120 v, dc.

NORMAL a-c POWER CONSUMPTION: 456 w.

TAPE: Chadless.

KEYBOARD: Standard Communication, English Characters.

CHARACTERS PER LINE: 72.

NUMBER OF CIRCUITS HANDLED: 1 or 2.

PRINCIPAL COMPONENTS

Component	Quantity
Control unit, power.....	1
Rectifier.....	1
Holder, number tab.....	1
Cabinet.....	1
Signal indicator panel.....	1
Reel, number tape.....	1
Relay control unit.....	1
Reperforator, typing.....	2
Winder, tape.....	1
Transmitter-distributor, 3-unit.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	475	1,304
Total volume (cu ft).....	21	99.32
Ship tons.....		2.5

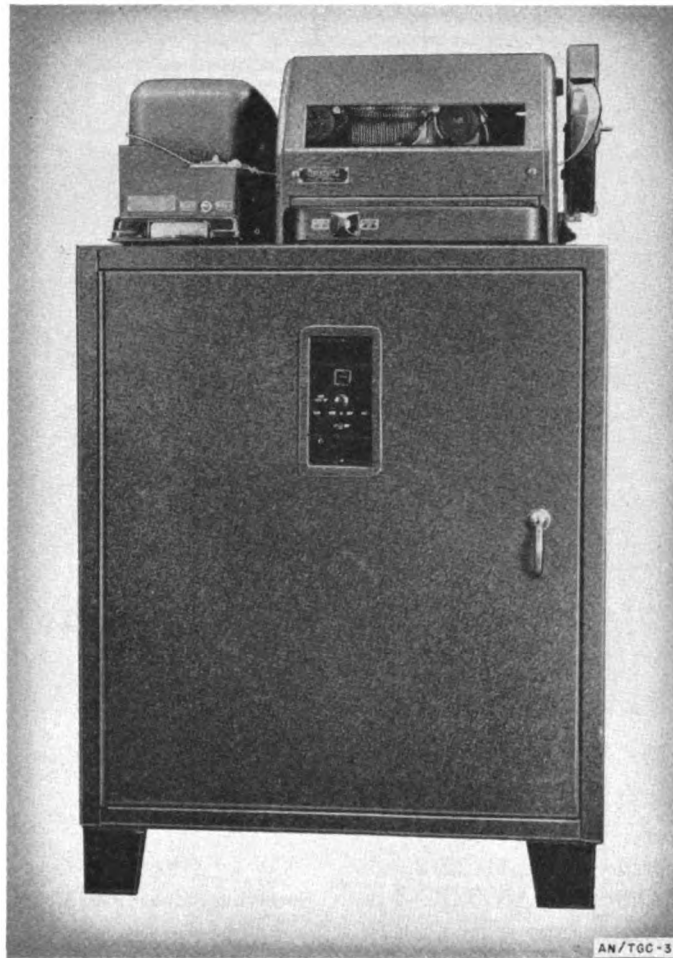


Figure 10. Teletypewriter Set AN/TGC-3.

Status: Substitute/Std. *Stock No.:* 4TW133A2.
Reference: TM 11-2214.

Teletypewriter Set AN/TGC-3 is a cabinet type table with a typing reperforator for receiving only, and a transmitter-distributor for sending to a radio transmitter or a wire circuit. The typing reperforator has a holding-magnet selector. The transmitter-distributor and typing reperforator are supplied with an a-c series-governed motor. The AN/TGC-3 is identical to Teletypewriter TT-10/FG except that it is not equipped with a synchronizing circuit for receiving from a radio channel.

Teletypewriter Set AN/TGC-3 is used in fixed-plant, wire teletypewriter systems of permanent or semipermanent installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, telegraph, on a 20- or 60-ma circuit; polar type, telegraph, 10- or 30-ma circuit.
POWER SUPPLY REQUIRED: Motor; 115 v, 50 to 60 cyc ac; rectifier; 95/125 or 190/250 v, 25 to 60 cyc ac.
NORMAL POWER CONSUMPTION: 290 w.
SPEED OF OPERATION: 60 wpm (368 opm).

PRINCIPAL COMPONENTS

Component	Quantity
Table, WECo type 133A2.....	1
Typing reperforator, Teletype part FPR21GB226.....	1
Power rectifier, WECo KS-5988.....	1
Transmitter-distributor, Teletype part XD86FR.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	212	642
Total volume (cu ft).....	11.5	34
Ship tons.....		.9

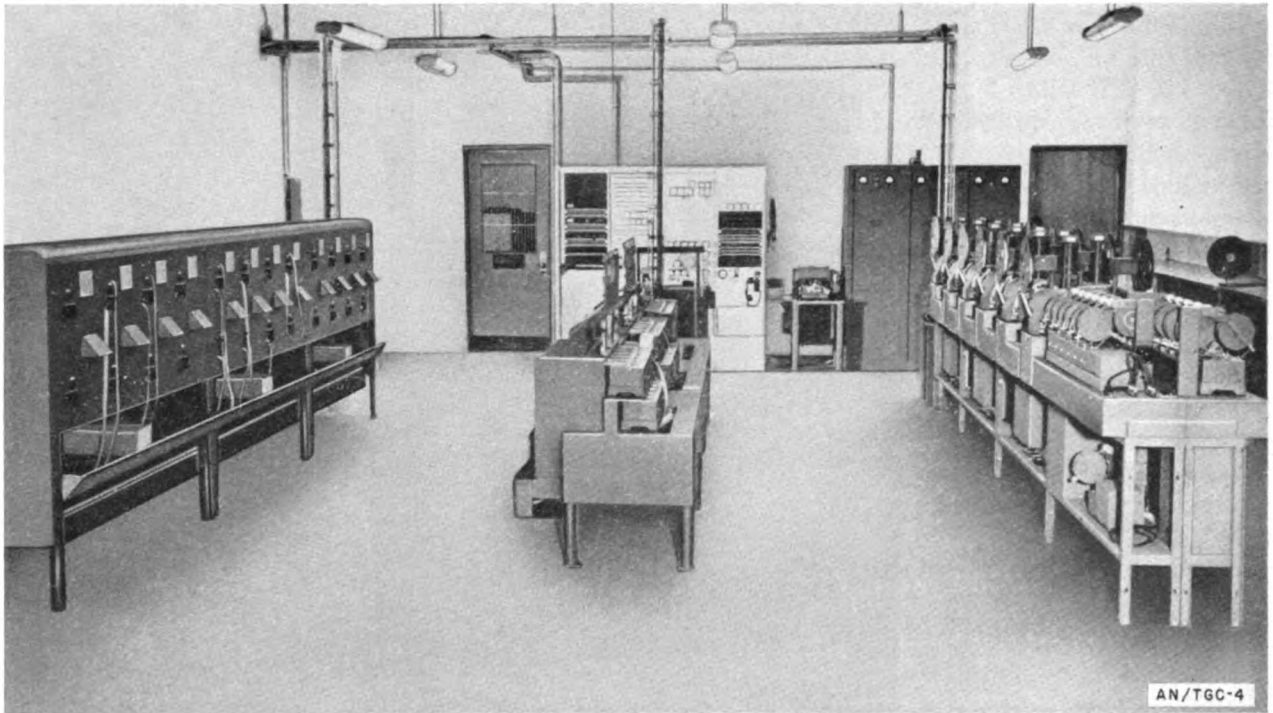


Figure 11. Teletypewriter Central Office Set AN/TGC-4, Typical Installation.

Status: Standard. Reference: TM 11-2212.

Teletypewriter Central Office Set AN/TGC-4 is a semiautomatic, teletypewriter tape relay system consisting of groups of equipment units installed at a signal center and wired together to form an operating system for the purpose of relaying teletypewriter messages.

Teletypewriter Central Office Set AN/TGC-4 is particularly suitable for the accurate and efficient handling of large amounts of teletypewriter traffic because it eliminates the necessity for manual preparation of perforated tape on relayed messages. The AN/TGC-4 is used at large signal centers such as a headquarters of a theater of operations or at large headquarters in the zone of the interior.

TECHNICAL CHARACTERISTICS*

PRINCIPAL COMPONENTS

Component	Length (in.)	Depth (in.)	Width (in.)	Weight (lb.)
Linefinder 930-A equipped for 24 lines.....	24¼	17	83¾	291
Receiving frame 1057-A.....	20¼	20	76¾	247.5

Component	Length (in.)	Depth (in.)	Width (in.)	Weight (lb.)
Receiving table 940-A and trough.....	66¼	28½	59¾	673
Sending frame 1056-A.....	20¼	20	76¼	190
Sending table 910-A with 915-A tape basket.....	53¼	38¾	38¾	223
Stand 921-A with two 920-A chassis.....	54	13¼	60	148
Stand 939-A with 938 A chassis.....	51½	13¼	52	203
Switchboard 1036-A.....	20¼	20	76¾	230
Switchboard 1063-A.....	20¼	20	76¾	188
Supervisor's table 909-A.....	24	27¾	40	130¼
Table 980-A with exhauster..	27¾	24	60	311
Table 985-A.....	30	20	26½	74
Transmitter distributor, multiple.....	40¾	7½	5¾	63
Transmitter distributor, single.....	14¾	6¾	7¼	25½
Transmitter distributor 1045-A.....	15½	8	9	40
Typing reperforator.....	9	11¼	7¾	33½

WEIGHT AND VOLUME*

* The number of equipment units, the total weight, volume, and characteristics depend on the requirements for which the teletypewriter central office is engineered.

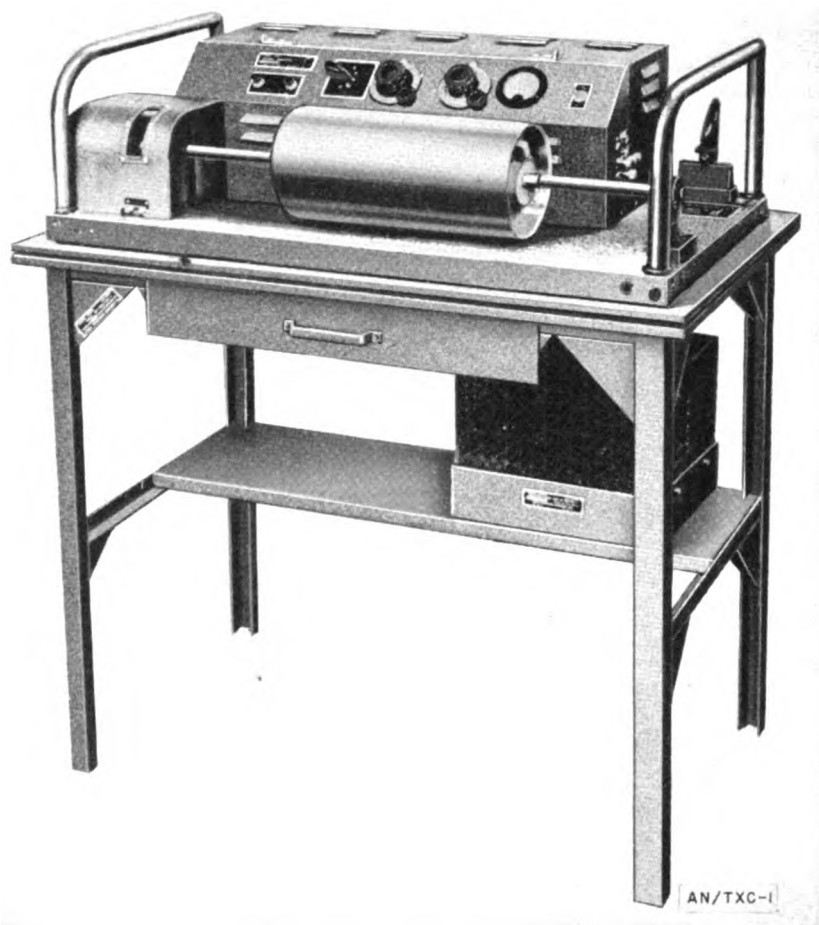


Figure 12. Facsimile Set AN/TXC-1.

Status: Standard. *Stock No.:* 6C25-TXC1 (AN/TXC-1), 6C25-TXC1A (AN/TXC-1A), and 6C25-TXC1B (AN/TXC-1B). *Reference:* TM 11-2258.

Facsimile Set AN/TXC-1 (*) represents AN/TXC-1, AN/TXC-1A, and AN/TXC-1B. The AN/TXC-1 (*) is an electromechanical-optical facsimile set of the revolving drum type. It provides for the transmission and reception of printed, written, drawn, or photographic copy over regular voice communication channels. The original copy for transmission may be up to 12 by 18 inches in dimensions, but the actual message or picture for transmission should not exceed 12 by

17½ inches for both photographic and direct recording. Transmission may be arranged for reception as a negative on film, as a positive on bromide photographic paper, or on direct recording paper (Teledeltos). The transceiver unit includes a driving motor, rotating drum, fork oscillator unit, regulator unit, signal and phasing circuit components, transmitting optical system, receiving optical system, and control panel.

Facsimile Set AN/TXC-1 (*) is used at the higher levels of tactical communications and in the communication systems of the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS:

Input (for reception): -45 to -15 dbm.

Output (for transmission): 0 to +26 dbm.

OPERATING SPEED: Scans at 96 lines per in. at 60 rpm; will receive or transmit a page 12 in. by 18 in. in 20 min.

LOCATION IN SYSTEM: At subscriber end of telephone loop.

RANGE: Dependent on characteristics of telephone or radio channel used.

POWER SOURCE: 100 to 130 v, 50 to 65 cyc ac.

NORMAL A-C POWER CONSUMPTION: 250 w.

LEVEL INDICATION: db meter.

FREQUENCIES: Am 1,800 cps, double side band, width 900 to 2,700 cps.

LINE TERMINATIONS:

AN/TXC-1 has UC or KC coupling coil or may be connected directly to transmission line.

AN/TXC-1A and -1B have UC coupling coil only or may be connected directly to transmission line.

Note. For operation over radio circuits, a Converter CV-2/TX can be used with, but is not part of, the AN/TXC-1 (*). The purpose of the CV-2/TX is to transform the audio frequency a-m signal to an audio frequency f-m signal at the sending station and from an audio frequency f-m signal to an audio frequency a-m signal at the receiving station.

PRINCIPAL COMPONENTS

Component	Quantity		
	AN/TXC-1	AN/TXC-1A	AN/TXC-1B
Facsimile transceivers:			
TT-1/TXC-1.....	1	0	0
TT-1A/TXC-1.....	0	1	0
TT-1B/TXC-1.....	0	0	1
Table MT-252/TXC1...	1	1	0
Table MT-252A/TXC1...	0	0	1
Rectifier Power Unit PP-86/TXC-1.....	1	1	0
Rectifier Power Unit PP-86A/TXC-1.....	0	0	1
Photographic Equipment PH-549/TXC-1.....	1	1	1
Loudspeaker LS-11.....	1	0	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	190	783
Total volume (cu ft).....	10	39
Ship tons.....		1



Figure 13. Typical Station Protectors.

Status: AR-6 Standard; AR-9 Standard. *Stock Nos.:* 4E4006, 4E4009. *Reference:* TM 11-676.

Protectors AR-6 and AR-9 are composed of

open-spaced cut-outs (carbon blocks) and tubular fuses mounted on porcelain blocks. They are designed to protect personnel and equipment from excessive currents or voltages induced in telephone lines from foreign sources, such as lightning, other atmospheric disturbances, or electric power lines.

Protector AR-6 is a two-wire protector equipped with a weatherproof metal cover and a galvanized iron mounting bracket. It is intended for outside use.

Protector AR-9 is a two-wire protector. It does not include a weatherproof case. The Protector AR-9 is intended for inside use only.

Protectors AR-6 and AR-9 are designed for use on common battery or local battery telephone loops installed in fixed or permanent installations.

TECHNICAL CHARACTERISTICS

EXCESSIVE CURRENT PROTECTION: Fuses, tubular, designed to operate with a current of 7 to 10 amp.

EXCESSIVE VOLTAGE PROTECTION: Open-spaced cut-outs (carbon blocks), designed to operate at approx 350 v.

WEIGHT AND VOLUME

	Length (in.)	Width (in.)	Depth (in.)	Weight (lb.)	Volume (cu. ft.)
AR-6.....	6	3	2	1.4	.2
AR-9.....	5	4	2	1.5	.3

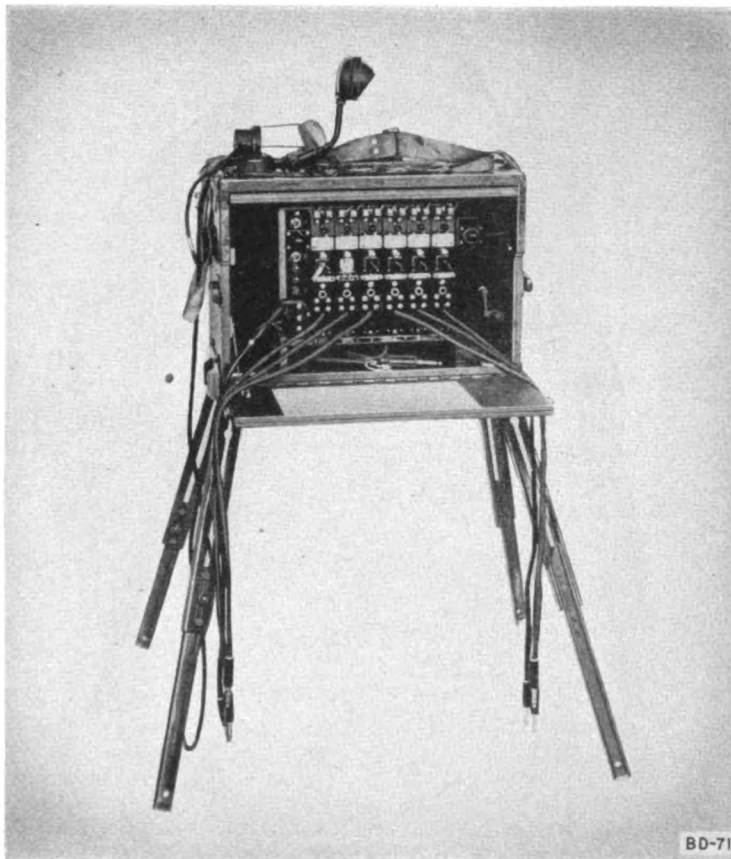


Figure 14. Switchboard BD-71.

Status: Standard. Stock No.: 4C9971. Reference: TM 11-330.

Switchboard BD-71 is a portable, monocord, magneto-telephone switchboard for use primarily in field wire systems. Each switchboard contains all the equipment necessary for terminating and switching field telephone circuits. All elements of the switchboard are contained in a plywood case which has carrying handles, an adjustable carrying strap, and four collapsible steel legs. Switchboard BD-71 is designed for use at an infantry battalion headquarters. It can be used at any headquarters that requires a switchboard of the type and capacity of the BD-71.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Magneto lines per position: 6.
- Cord circuits per position: Monocord.
- Operator's telephone circuit: 1.
- Night-alarm circuit: 1.
- Switchboard illumination circuit: 1.
- Simplex coils: 2 Coil C-161, connected to first 2-line circuits.
- Dry cells required: 6 ea Battery BA-30.

MDF protection type: Spark gap.

Number of protected pr: 6.

Protector panel: Integral.

b. WORKING LIMITS IN OHMS:

No repeat coils in line circuit: 3,000.

With repeat coils in line circuit: 2,000.

Min insulation resistance: 1,000.

c. TRANSMISSION LOSSES AT 1,000 CYCLES.

Average losses magneto line to magneto line	Added losses for ea repeat coil in circuit	Losses due to operator's telephone set
.5 db	.7 db	{ Operated: 3 db Normal: 1.5 db

PRINCIPAL COMPONENTS

Component	Quantity
Bare unit.....	1
Headset HS-30.....	1
Chest Set H/18/GT.....	1
Switchboard Unit EE-2-C.....	6
Operator's telephone set.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	48	84
Total volume (cu ft).....	1.5	4.6
Ship tons.....		.1

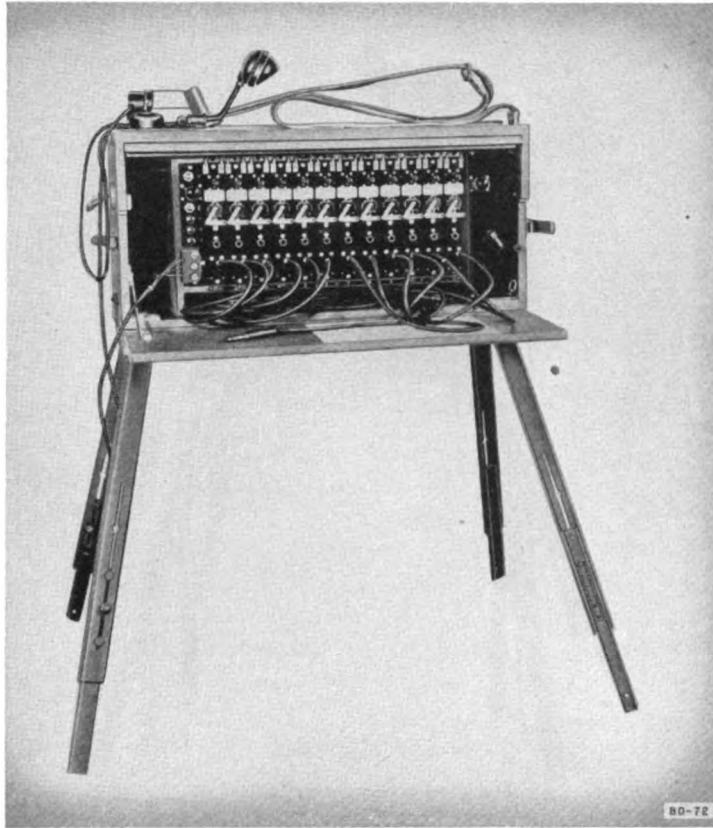


Figure 15. Switchboard BD-72.

Status: Standard. Stock No.: 4C9972. Reference: TM 11-330.

Switchboard BD-72 is a portable, monocord, magneto-telephone switchboard for use primarily in field wire systems. Each switchboard contains all the equipment necessary for terminating and switching field telephone circuits. All elements of the switchboard are contained in a plywood case which has carrying handles, an adjustable carrying strap, and four collapsible steel legs. Switchboard BD-72 is designed for use at an infantry regimental headquarters. It can be used at any headquarters that requires a switchboard of the type and capacity of the BD-72.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Magneto lines per position: 12.
- Cord circuits per position: Monocord.
- Operator's telephone circuit: 1.
- Night-alarm circuit: 1.
- Switchboard illumination circuit: 1.
- Simplex coils: 4 Coil C-161, connected to first 4 line circuits.

- Dry cells required: 6 ea Battery BA-30.
- MDF protection type: Spark gap.
- Number of protected pr: 12.
- Protector panel: Integral.

b. WORKING LIMITS IN OHMS:

- No repeat coils in line circuit: 3,000.
- With repeat coils in line circuit: 2,000.
- Min insulation resistance: 1,000.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

Average losses magneto line to magneto line	Added losses for ea repeat coil in circuit	Losses due to operator's telephone set
.5 db	.7 db	} Operated: 3 db Normal: 1.5 db

PRINCIPAL COMPONENTS

Component	Quantity
Bare unit	1
Headset HS-30	1
Chest Set H-18/GT	1
Switchboard Unit EE-2-C	12
Operator's telephone set	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	72	137
Total volume (cu ft)	2	5
Ship tons .....		.1

Status: Standard. *Stock No.:* See note below.

Switchboard BD-74-(*) represents models A through K of the BD-74. Switchboard BD-74-(*) is a single-panel, unit-type communication switchboard contained in a mahogany cabinet. It may be equipped with both common and local battery telephone circuits, through line circuits, and simplex circuits. Provision is made for terminating local battery lines, tie lines, and trunk lines to other switchboards. The basic unit of the BD-74-(*) is a set of four jacks, a supervisory lamp, a relay, and a repeat coil. This switchboard is designed to be very flexible in its application. It is made up of a number of different circuits each of which serves a different basic purpose. These circuits are made up in different combinations. When Switchboard BD-74-(*) is ordered, the requirements of the project are studied, and the particular combination ordered, which will most satisfactorily fill these requirements.

The purpose of Switchboard BD-74-(*) is to provide switching, power, supervision, monitoring, test point, and permanent interconnection of telephone circuits for fixed-plant Coast Artillery fire-control telephone systems; at the same time, it provides patching-cord facilities for temporary rerouting of fire-control telephone circuits within the system.

Note. Stock No. 4C9974A1 (BD-74), stock No. 4C9974B1 (BD-74-A), stock No. 4C9974C2 (BD-74-C), stock No. 4C9974D2 (BD-74-D), stock No. 4C9974E1 (BD-74-E), stock No. 4C9974F1 (BD-74-F), stock No. 4C9974G5 (BD-74-G), stock No. 4C9974H1 (BD-74-H), stock No. 4C9974J1 (BD-74-J), and stock No. 4C9974K (BD-74-K).

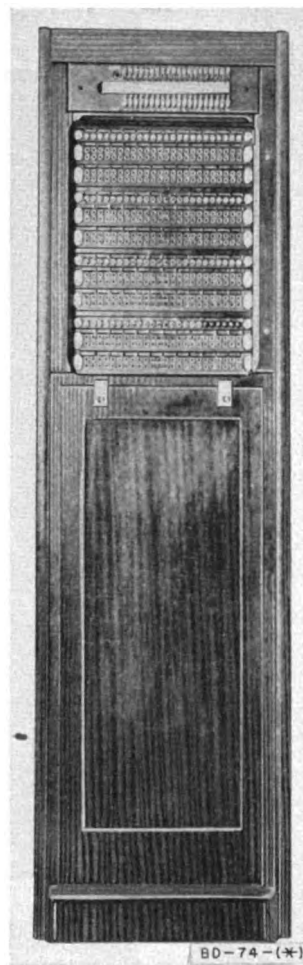


Figure 16. Switchboard BD-74-H

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

Circuits	Switchboard BD-74 combinations									
	A	B	C	D	E	F	G	H	J	K
Common battery telephone circuits.....	90	80	70	60	48	0	0	0	80	48
Simplex circuits.....	0	10	0	10	10	0	0	0	0	0
Through line circuit with monitoring jack....	0	0	40	48	72	168	0	0	0	0
Single cut-off jack circuit.....	24	24	8	8	8	0	240	432	76	212
Transmitter battery supply circuit with simplex.....	0	0	0	0	0	0	48	0	0	0
Auxiliary supervisory lamp circuit.....	6	6	2	2	0	0	0	0	0	0
Power supply circuit with 1½-amp fuse.....	1	1	1	1	0	0	0	0	1	1
Fuse-alarm circuit.....	1	1	1	1	0	0	1	0	1	1
Ringdown circuit.....	0	0	0	0	0	0	0	0	0	8
Operator's key and jack circuit.....	0	0	0	0	0	0	0	0	1	1
Night-alarm circuit.....	0	0	0	0	0	0	0	0	1	1

Auxiliary equipment required: Telephone Box EE-91 with handset or headset or Telephone EE-8-(*) with handset or headset, 1.

Power requirements: 30 v dc, 110 v ac.

MDF protection type: Heat coils and carbon blocks.

Number of protected pr.: 300.

Protector panel: Panel BD-75.

b. WORKING LIMITS IN OHMS:

Max line resistance is 1,200 ohms at a min battery voltage of 28 v.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	699	999
Total volume (cu ft).....	23	33
Ship tons.....		.8

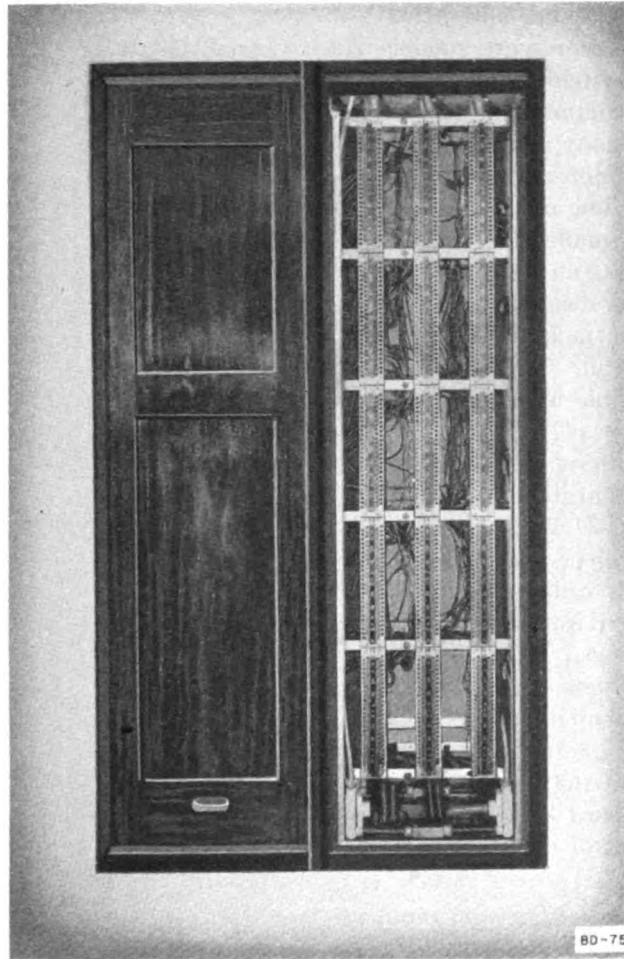


Figure 17. Panel BD-75.

Status: Standard. *Stock No.:* 4E3675.

Panel BD-75 is a main distributing frame consisting of an angle-iron framework inclosed in a mahogany cabinet. Terminal strips are attached to the line side of the angle-iron framework and provide protection for incoming lines. Other terminal strips are attached to the switchboard side and provide termination for the switchboard cables. Electric heaters are provided.

The function of Panel BD-75 is to simplify the switchboard wiring in large installations and to provide simple means of making permanent, cross-connections either between circuits on the same switchboard or between circuits on different

switchboards in the same installation. Panel BD-75 is used with Switchboard BD-74-(*) in fixed-plant Coast Artillery fire-control telephone systems.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: 110 v. ac for heating circuit.
LINE PROTECTION: Heat coil and carbon block.
NUMBER OF PROTECTED PAIRS: 300 to 450.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	200	450
Total volume (cu ft).....	23	33
Ship tons.....		.8

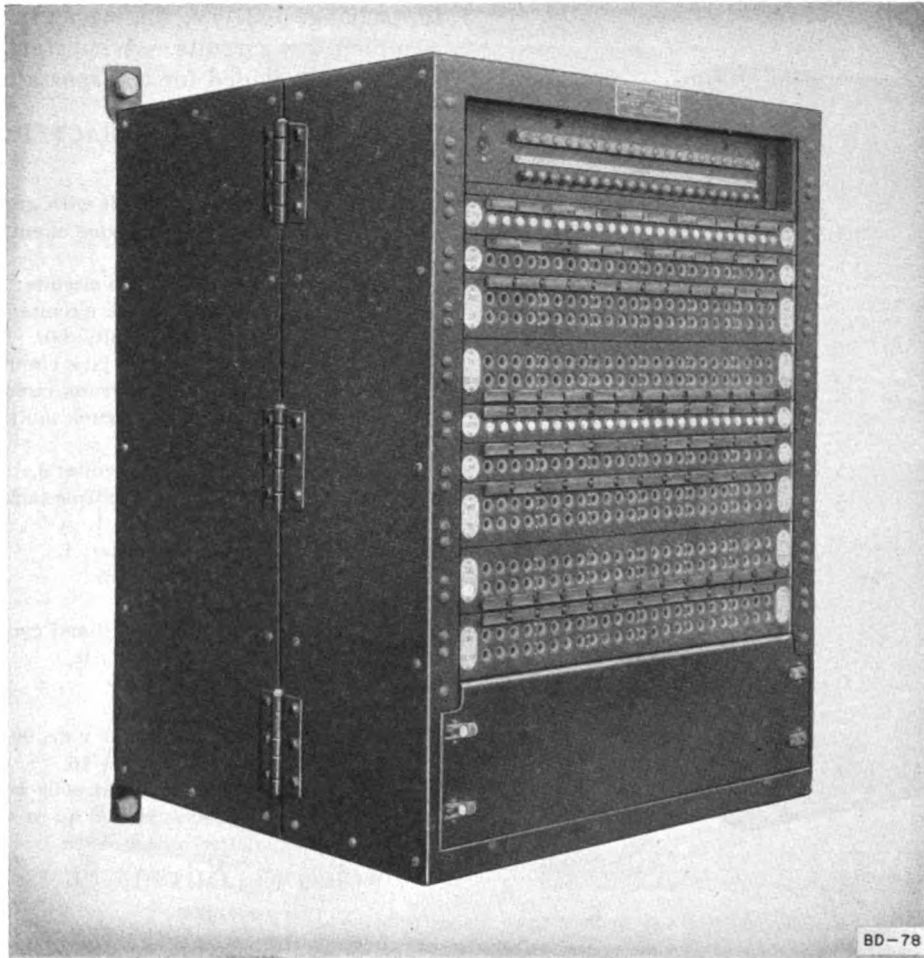


Figure 18. Switchboard BD-78, three-quarter view.

Status: Standard. *Stock No.:* 4C9978.

Switchboard BD-78 is a single-panel, common battery telephone switchboard intended for use in fire-control communication systems. The basic unit of the BD-78 is a set of four jacks, a supervisory lamp, a relay, and a repeat coil. The apparatus is mounted on an angle-iron framework inclosed with removable steel plates. The front section of the cabinet is hinged so that all apparatus is easily accessible.

The purpose of Switchboard BD-78 is to provide switching, power, supervision, monitoring, test point, and permanent interconnection of telephone circuits for Coast Artillery fire-control telephone systems. The BD-78 is also designed to provide patching-cord facilities for temporary rerouting or paralleling of fire-control telephone circuits and simplex telegraph or signaling circuits within the system.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

Common battery telephone circuits: 48.

Simplex circuits: 48.

Power supply circuit with 1½-amp fuse: 1.

Fuse-alarm circuit: 1.

Auxiliary equipment required: 1.

Telephone Box EE-91 with handset or headset or

Telephone EE-8-(*) with handset or headset.

Power requirements: 30 v dc, 110 v ac.

Line protection: None.

b. WORKING LIMITS IN OHMS:

Max line resistance is 1,100 ohms at a min battery voltage of 28 v.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	225	365
Total volume (cu ft).....	5	7.6
Ship tons.....		.19

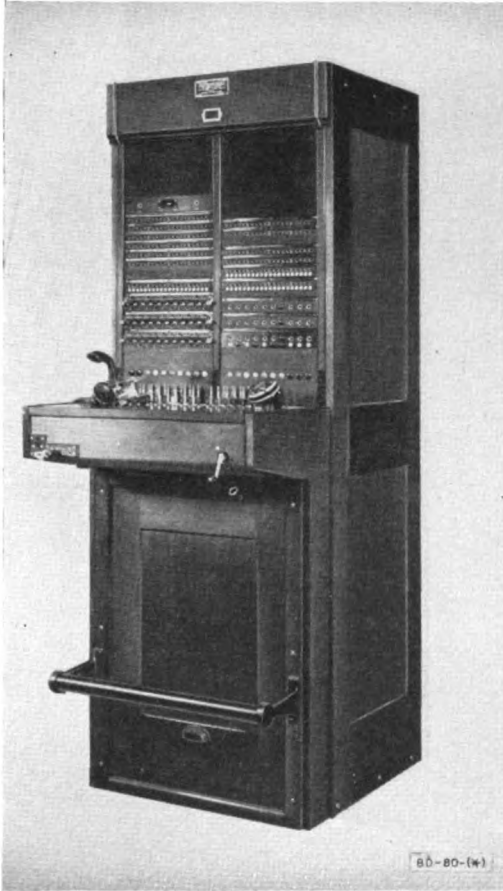


Figure 19. Switchboard BD-80-A.

Status: Limited Std. Stock No.: 4C9980.7.1 (BD-80) and 4C9980.7A-1 (BD-80-A). Reference: TM 11-335.

Switchboard BD-80-(*) represents BD-80 and BD-80-A. The BD-80-(*) is a single-position, two-panel, manually operated telephone switchboard. It is arranged to serve magneto and common battery lines, common battery manual trunks, and dial (automatic) trunks. It is equipped with multiple jacks for use when two or more switchboards are used as one installation. Lamp signals are provided for signaling on the common battery lines and trunks and for supervision on the cord circuits. Drop signals are provided for the magneto lines, and magneto recall lamps are associated with each cord circuit.

The construction and design of Switchboard BD-80-(*) permits its use for installations of from one to six switchboards. Rubber-jacketed cable and spade terminal strip facilities are provided for the interconnection of switchboards at the same installation and also for the connection

to exchange battery, ringing current supply, and grouping key circuits. A substantial case (Case CS-58) is provided for transportation.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit with grouping key: 1.
- Auxiliary operator's telephone circuit: 1.
- Dial cord circuit: 1.
- Local battery magneto line circuits: 30.
- Local battery multiple jack circuits: 60.
- Common battery line circuits: 60.
- Common battery multiple jack circuits: 120.
- Common battery manual trunk circuits: 3.
- Common battery manual trunk multiple jack circuits: 6.
- Dial (automatic) trunk circuits: 3.
- Dial (automatic) trunk multiple jack circuits: 6.
- Power and heating circuit: 1.
- Conference circuit (10 jacks): 1.
- Cord circuits (universal): 15.
- Grouping key circuit: 1.
- Emergency ringing circuit (hand generator): 1.
- Battery and ground circuit: 1.
- Night-alarm switch: 1.
- Fuse-alarm switch: 1.
- Power requirement: 40 to 56 v dc, 90-amp-hr capacity such as 4 ea. Battery BB-46.
- MDF protection type: Heat coils and carbon blocks.
- Number of protected pr: 100 on ea vertical.
- Protector panel: Frame FM-19.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
Local battery telephone:		
Without repeat coils.....	3,000	1,000
With repeat coils.....	2,000	1,000
Common battery telephone..	500	10,000
Trunk to dial office.....	750	30,000
Trunk to manual office ¹	750	10,000

¹ Working limits of distant office controlling.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Magneto line to magneto line: .2 db.
 - Magneto line to common battery line: .4 db.
 - Magneto line to trunk: 1.1 db.
 - Common battery line to common battery line: .5 db.
 - Common battery line to trunk: 1.2 db.
 - Added loss for ea repeat coil in circuit: .7 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: 1 db.
 - Operated: 2.5 db.
 - Monitoring key:
 - Operated: .2 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	739	900
Total volume (cu ft).....	45	70
Ship tons.....		1.75

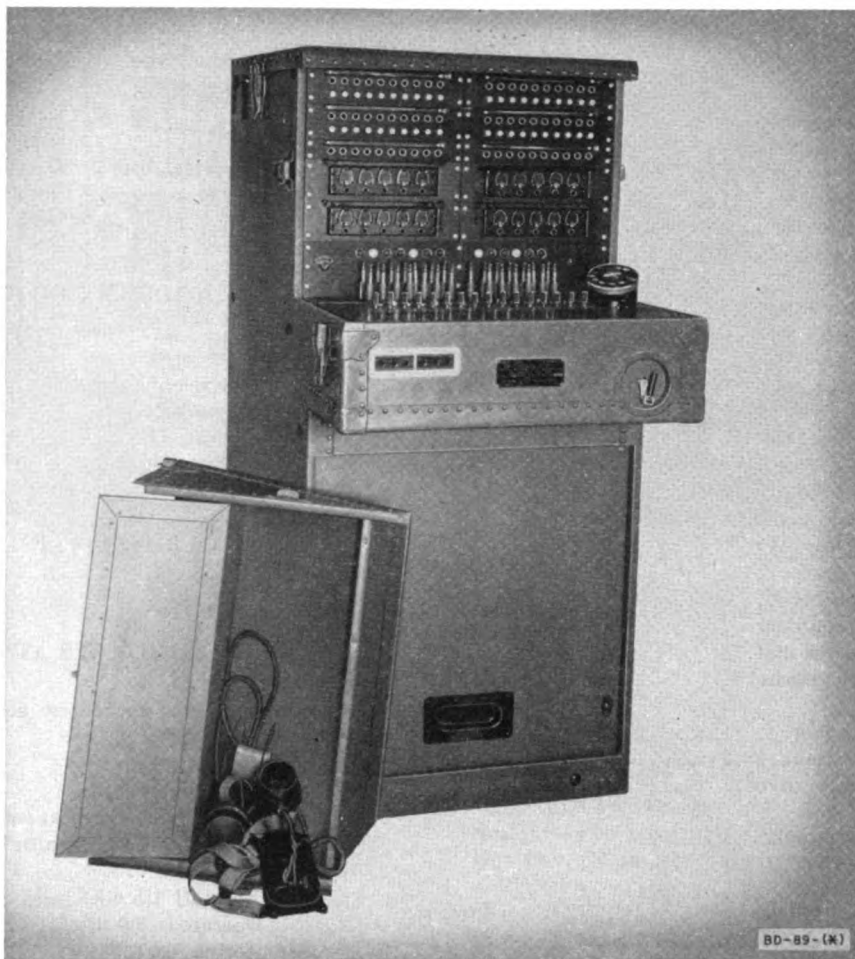


Figure 20. Switchboard BD-89-T1, front view.

Status: Substitute/Std. *Stock No.:* 4C9989.
Reference: TM 11-340.

Switchboard BD-89-(*) represents models A through G of the BD-89. Switchboard BD-89-(*) is a complete, portable, single-position, two-panel nonmultiple, manually operated telephone switchboard. It serves both magneto and common battery lines, and it is arranged for handling, originating, and terminating trunk and tie line traffic. All the jacks and the lamp and drop signals associated with the universal cord circuits are

located on the face of the equipment. Lamp signals are provided for the common battery lines and for supervision on the cord circuits. Drop signals are provided for the magneto lines with magneto recall lamps associated with each cord circuit. A terminal strip at the rear of the switchboard, to which the line jacks are wired, provides for connections to spade terminal strips on Cabinet BE-79, the main distributing frame. Terminals on the switchboard are provided for making connections to the storage battery, ringing current supply, and grouping key circuit.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

	<i>BD-89-A, -B, -C, -D, -E</i>	<i>BD-89-G</i>
Operator's telephone circuit with grouping key.	1	1.
Universal cord circuits	13	13.
Emergency ringing circuit (hand generator).	1	1.
Line circuits, magneto (drop and jack).	20	20.
Line circuits, common battery (lamp and jack).	37	40.
Dial cord circuit	1	1.
Trunk circuit two-way to dial (automatic) telephone exchange.	1	0.
Trunk circuit two-way common battery manual telephone exchange.	2	0.
Trunk circuits universal, two-way to common battery manual or dial (automatic) telephone exchange.	0	4.
Line circuit, outgoing	1	3.
Line circuits, through	2	2.
Conference circuit (five jacks).	1	1.
Switchboard test circuit.	1	1.
Night-alarm circuit	1	1.
Fuse-alarm circuit	1	1.
Battery and ground circuit.	1	1.
Power and heating circuit.	1	1.
Selective ringing, two-party.	Yes	Yes.
Power requirement	22 to 30 v dc, 90 amp-hr, such as 2 Battery BB-46.	22 to 30 v dc, 90 amp-hr, such as 2 Battery BB-46.

	<i>BD-89-A, -B, -C, -D, -E</i>	<i>BD-89-G</i>
MDF protection type	Heat coils and carbon blocks.	Heat coils and carbon blocks.
Number of protected protector panel	80	80.
	Cabinet BE-79.	Cabinet BE-79.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
Local battery telephone:		
Without repeat coils	3,000	1,000
With repeat coils	2,000	1,000
Common battery telephone	300	10,000
Trunk to manual office ¹	750	10,000
Trunk to dial office: ¹		
BD-89-A, -B, -C, -D, -E	750	15,000
BD-89-G	1,000	30,000

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Line to line: .3 db.
 - Line to trunk: 1.0 db.
 - Added loss for each repeat coil in circuit: .7 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: 1.5 db.
 - Operated: 3.0 db.
 - Monitoring key:
 - Operated: .2 db.

¹ Working limits of distant office usually will be controlling.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	400	1,015
Total volume (cu ft)	24	56
Ship tons		1.3

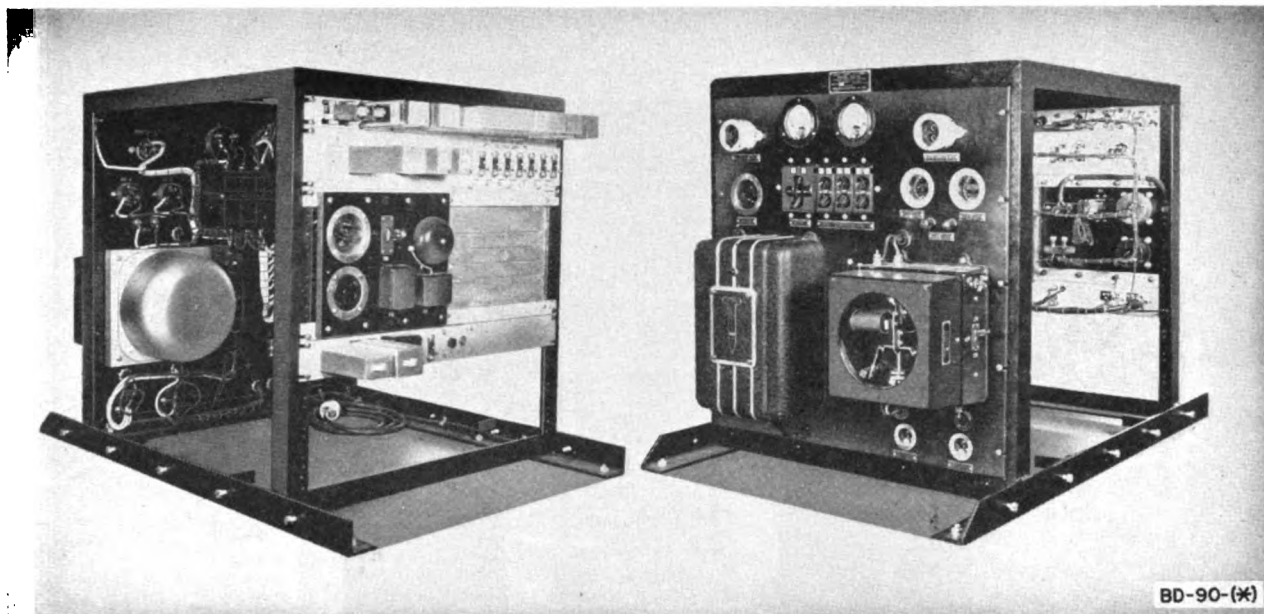


Figure 21. Panel BD-90, front and rear views.

Status: Limited/Std. Stock No.: 3H4090. Reference: TM11-338.

Panel BD-90-(*) represents BD-90 and BD-90-A. Panel BD-90-(*) serves as a control and connecting point for the 48-volt battery circuits, as a source of ringing power for the switchboard, and as an alarm panel. It is a steel frame box structure with front and rear panels. The front panel is equipped with receptacles and binding posts for connection to the battery and rectifier and to the switchboard or other equipment requiring 48 volts dc.

Circuit breaker switches on the panel control the power supply to the switchboard or other equipment and, in addition, protect these circuits against overload. The lower part of the front panel is equipped with a telering power ringer to obtain 90-volt, 20-cycle ringing power from a 110-volt, 60-cycle source. It is also equipped with a vibrating interrupter which has a ringing transformer to obtain ringing power from the 48-volt storage battery.

TECHNICAL CHARACTERISTICS

POWER REQUIRED:

Ac: 110-v, 60-cyc supply.

Dc: 48-v, 90-amp-hr supply, such as 4 ea Battery BB-46.

POWER CONTROL:

Circuit breaker: 10-amp capacity.

Circuit breaker: 15-amp capacity.

POWER RINGING:

A-c equipment: Telering, vibrating type, requires 110 v, 60 cyc ac.

D-c equipment: Interrupter, vibrating type, requires 37 v, .75 amp dc.

CONTACT PROTECTION CIRCUIT FOR THE RINGING INTERRUPTER: 1.

NIGHT-ALARM CIRCUIT: 1.

NO-VOLTAGE ALARM CIRCUIT (RINGING VOLTAGE): 1.

FUSE-ALARM CIRCUIT: 1.

VOLTAGE SUPPLY CIRCUIT FOR CABINET BE-72: 1.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	230	505
Total volume (cu ft).....	16	19
Ship tons.....		.5

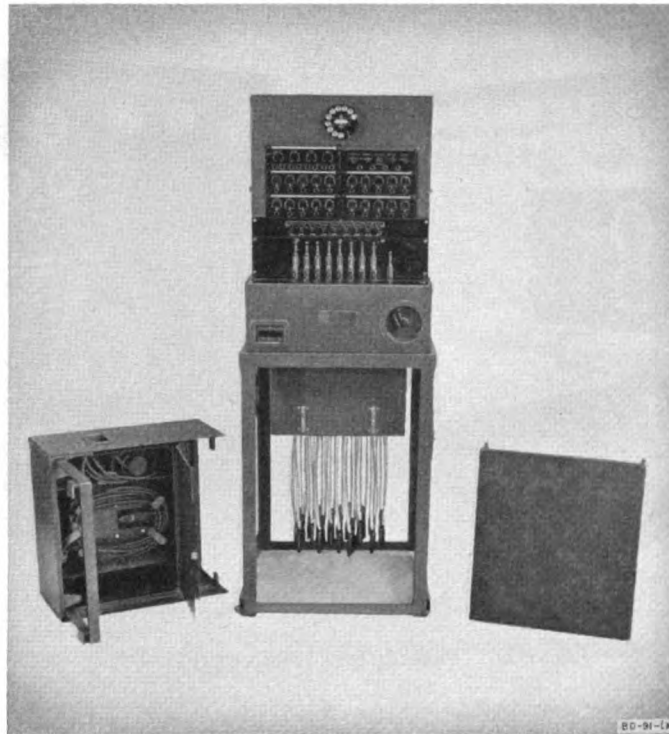


Figure 22. Switchboard BD-91-(B).

Status: Standard. Stock No.: 4C9991. Reference: TM 11-336.

Switchboard BD-91-(*) represents BD-91, BD-91-A, BD-91-B, BD-91-C, and BD-91-D. Switchboard BD-91-(*) is a complete, transportable, single-position, manually operated telephone switchboard for serving magneto lines, two-way trunks, and tie lines. Ring-down trunks are provided for connection to either manual common battery or automatic (dial) systems. Drop signals are associated with the lines and trunks for incoming signals and also with each cord circuit for recall signals. Terminating facilities are provided in rear of switchboard for connection of lines, power ringing, and external batteries.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Magneto line circuits: 20.
- Universal trunk circuits: 4.
- Cord circuits: 8.
- Dial cord circuit: 1.
- Jacks in conference circuit: 4.
- Grouping key: 1.
- Operator's circuit: 1.
- Simplex coils: 4 ea Coil C-161 connected into first 4-line circuits.
- Dry cells required: 8 ea Battery BA-30.

MDF protection type: Heat coils and carbon blocks
 Number of protected pr: 24.
 Protector panel: Integral.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
Local battery telephone:		
Without repeat coils.	3,000	1,000
With repeat coils.	2,000	1,000
Central office trunk.	Working limits of distant office less 300.	Working limits of distant office controlling.

c. TRANSMISSION LOSSES AT 1,000 CYC:

- (1) Average losses caused by equipment in switchboard connection:
 - Line to line: .4 db.
 - Line to trunk: .9 db.
 - Added loss for each repeat coil in circuit: .7 db.
- (2) Added losses due to operator's circuit bridge.
 - Push to talk key:
 - Normal: 1.5 db.
 - Operated: 3.0 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	215	380
Total volume (cu ft)	4.5	12.9
Ship tons .....		.3

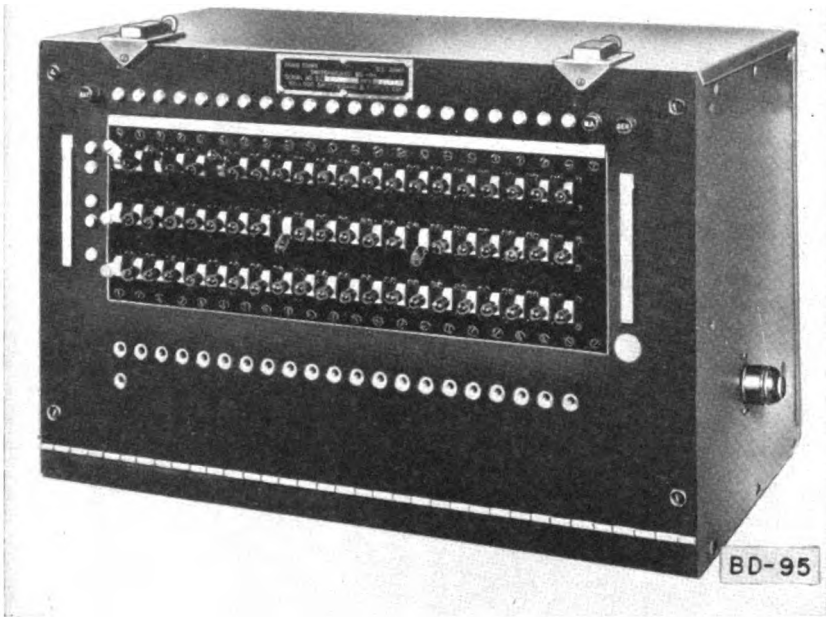


Figure 23. Switchboard BD-95.

Status: Standard. *Stock No.:* 4C9995.4. *Reference:* TM 11-2052.

Switchboard BD-95 is a cordless, local battery switchboard equipped with line lamp signal supervision. The BD-95 was designed for the switching of local battery magneto lines only, but it may be modified to handle common battery lines by inserting a capacitor in series with the common battery line. Twenty capacitors are provided for this purpose. Common battery lines modified in this manner provide only one-way incoming signaling and ring-off supervision.

Trunks or tie lines to other local battery switchboards may be established by utilizing the regular incoming line circuits. Switchboard BD-95 normally is used as an auxiliary to Switchboard BD-74 in harbor defense installations. It can be used as a switching central in small fixed-plant, local battery telephone systems.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

Magneto line circuits: 20.
Trunk circuits: See note below.
Connecting circuits: 5.
Night-alarm circuit: 1.
Line protection: None.
Power required: 24 to 30 v. dc.

Auxiliary equipment required:

Telephone Box EE-91 with handset or headset

or

Telephone EE-8-(*) with handset or headset.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
Local battery telephone:		
With repeat coils.....	3,000.....	1,000.
Without repeat coils..	2,000.....	1,000.
Central office trunk.....	Working limit of distant office less 300.	Working limit of distant office controlling.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

(1) Average losses caused by equipment in switchboard connection:

Line to line: .4 db.

Line to trunk: .9 db.

Added loss for each repeat coil in circuit: .7 db.

(2) Added losses due to operator's circuit bridge:

Operator's key operated: 3.0 db.

Operator's key normal: 1.5 db.

Note. Line circuits may be used to establish trunk or tie lines to other local battery switchboards.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	117	175
Total volume (cu ft).....	3.0	6
Ship tons.....	-----	.15

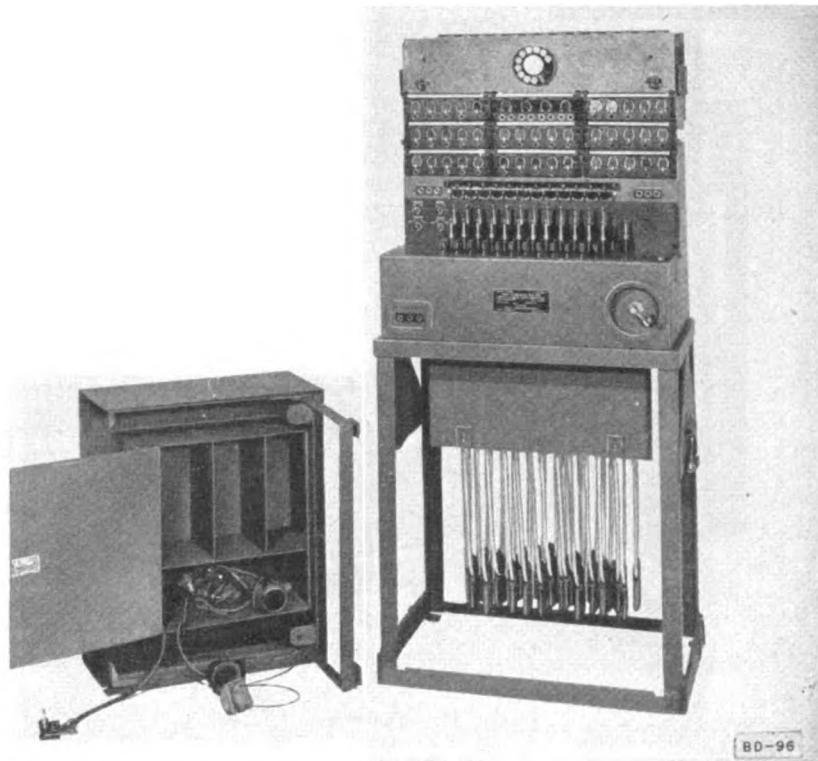


Figure 24. Switchboard BD-96.

Status: Standard. *Stock No.:* 4C9996.6. *Reference:* TM 11-332.

Switchboard BD-96 is a complete, transportable, single-position, manually operated, magneto telephone switchboard. The BD-96 was designed for use in field wire systems, and it is arranged to serve magneto lines. Trunk circuits are provided which may be used for connection to common battery lines of either manual or dial (automatic) central offices. Drop signals are provided for the lines and trunks and are associated with each cord circuit for recall signals. The top of the switchboard contains terminal facilities for the panel cable from the main distributing frame, BD-97, ringing circuit, grouping circuit, second operator's circuit, and for external batteries.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Magneto line circuits: 40.
- Universal trunk circuits: 4.
- Cord circuits: 12.
- Dial cord: 1.
- Jacks in conference circuit: 6.
- Grouping key: 1.
- Operator's circuit: 2.
- Dry cells required: 6 ea Battery BA-30.
- MDF protection type: Fuses and carbon blocks.

Number of protected pr: 44.

Protector panel: Panel BD-97.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
Local battery telephone:		
Without re-coils.....	3,000	1,000
With repeat coils.....	2,000	1,000
Central office trunk.	Working limits of distant offices less 300.	Working limits of distant office controlling.

c. TRANSMISSION LOSSES AT 1,000 CYCLES.

- (1) Average losses caused by equipment in switchboard connection:
 - Line to line: .4 db.
 - Line to trunk: .9 db.
 - Added losses for each repeat coil in circuit: .7 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: 1.5 db.
 - Operated: 3.0 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	200	365
Total volume (cu ft).....	4.5	9
Ship tons.....		.2

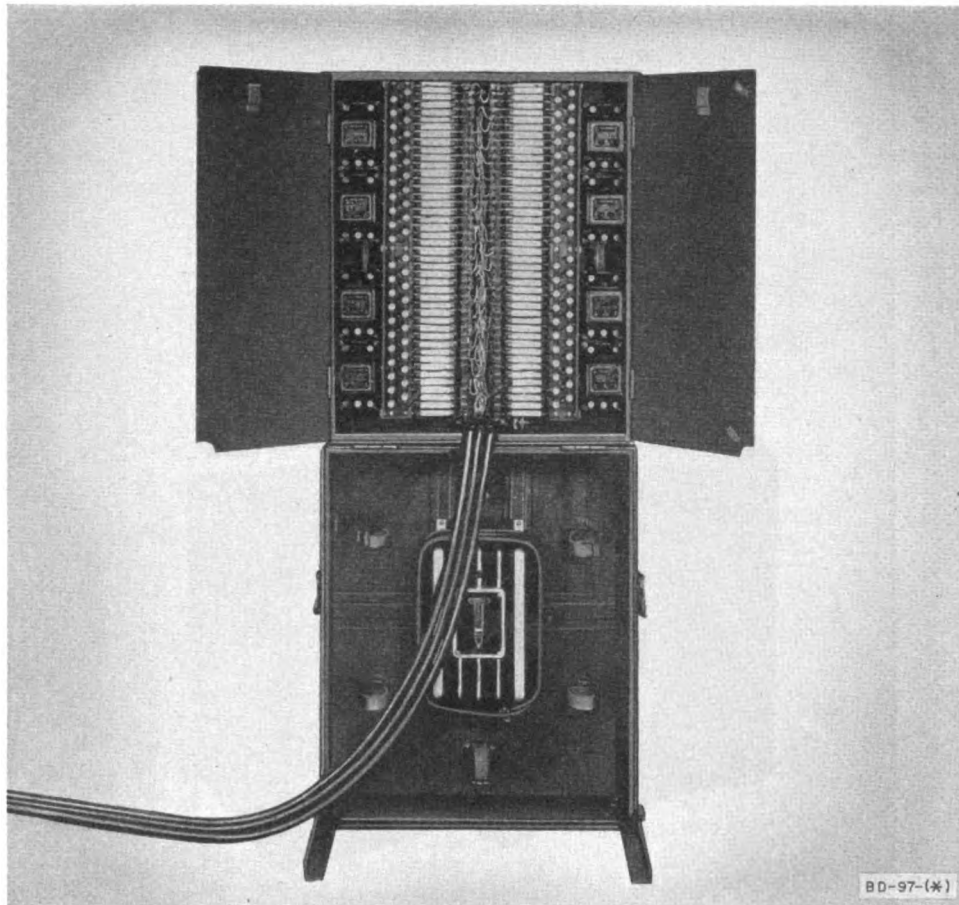


Figure 25. Panel BD-97, front view.

Status: Standard. *Stock No.:* 4E3697. *Reference:* TM 11-332.

Panel BD-97 is a portable, MDF unit designed for use with Switchboard BD-96. It includes a metal cabinet in which are mounted 2 vertical terminal strips of 22 line terminals each and 2 vertical rows of 22 fuses and carbon block protectors. On the protector panel are mounted eight repeat coils, four on each side. A 20-cycle ringer is mounted in the lower part of the cabinet. Three 21-foot, 15-pair, rubber-jacketed cables are permanently wired to the BD-97. The distant end of the cables are terminated in spade terminals for connection to the binding post terminals of Switchboard BD-96.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: 110 v, 60 cyc ac for telering.
LINE PROTECTION: 1-amp fuse and carbon block protector.
NUMBER OF PROTECTED PR.: 44.
SIMPLEX COILS: 8 Coil C-161; not connected into any line circuit.
RINGING EQUIPMENT: Telering; output 20 cyc ac.
INTERCONNECTION OF PANEL AND SWITCHBOARD: 3 ea 15-pr, rubber-jacketed cables (44 pr and ground wire).

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	150	285
Total volume (cu ft).....	5	11
Ship tons		2

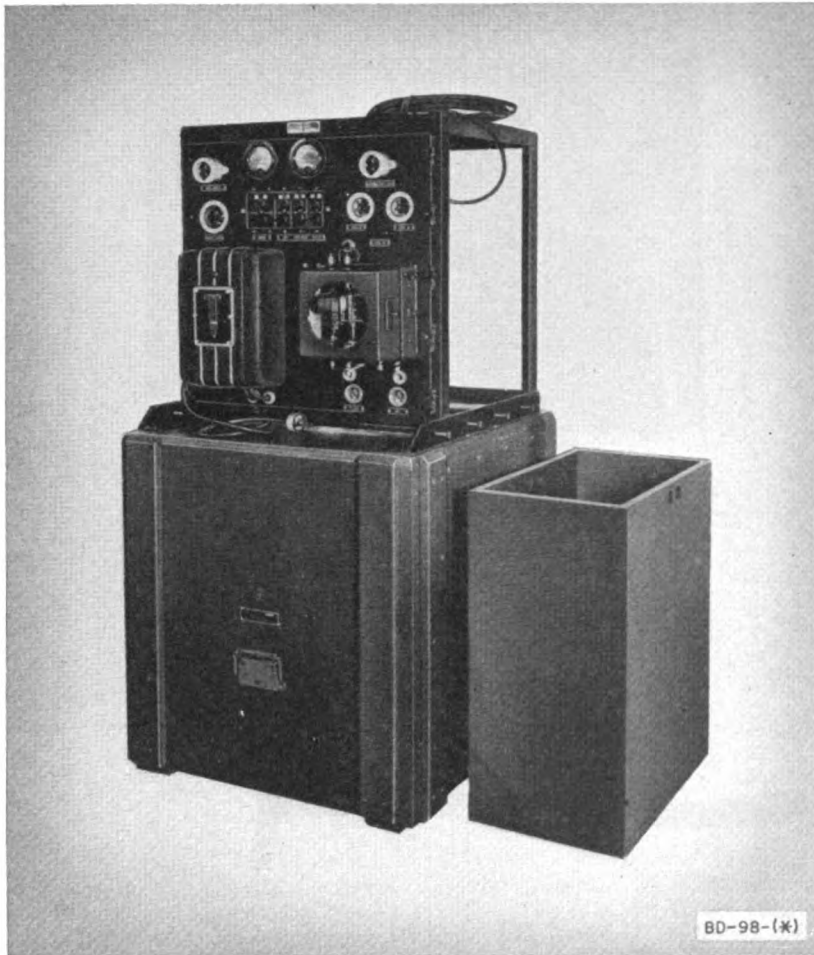


Figure 26. Panel BD-98, mounted on Case CS-71.

Status; Substitute/Std. *Stock No.:* 3H4098 (BD-98) and 3H4098A (BD-98-A). *Reference:* TM 11-340.

Panel BD-98-(*) represents BD-98 and BD-98-A. Panel BD-98-(*) serves as a control and connecting point for the 30-volt battery circuits and as a source of ringing power for the switchboard. It is a steel frame box structure with a front panel. The panel is equipped with receptacles and binding post for connection to the battery and rectifier, and to the switchboard or other equipment requiring 30-volt dc.

Circuit breaker switches on the panel control the power supply to the switchboard or other equipment and, in addition, protect these circuits against overload. The lower part of the panel is equipped with a Telering PE-250 used to obtain 90-volt, 20-cycle ringing power from 110-volt, 60-cycle source. It is also equipped with an

Interrupter PE-248 used to obtain ringing power from the 30-volt storage battery.

TECHNICAL CHARACTERISTICS

POWER REQUIRED:

Ac: 110-v, 60-cyc supply.

Dc: 30-v, 90-amp-hr supply, such as 2 ea. Battery BB-46.

POWER CONTROL:

Circuit breaker: 10-amp capacity.

Circuit breaker: 15-amp capacity.

POWER RINGING:

A-c equipment: PE-250, vibrating type, requires 110 v, 60 cyc ac.

D-c equipment: PE-248, vibrating type, requires 24 v, 1 amp dc.

WEIGHT AND VOLUMES

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	110	552
Total volume (cu ft).....	16	37
Ship tons.....		.9

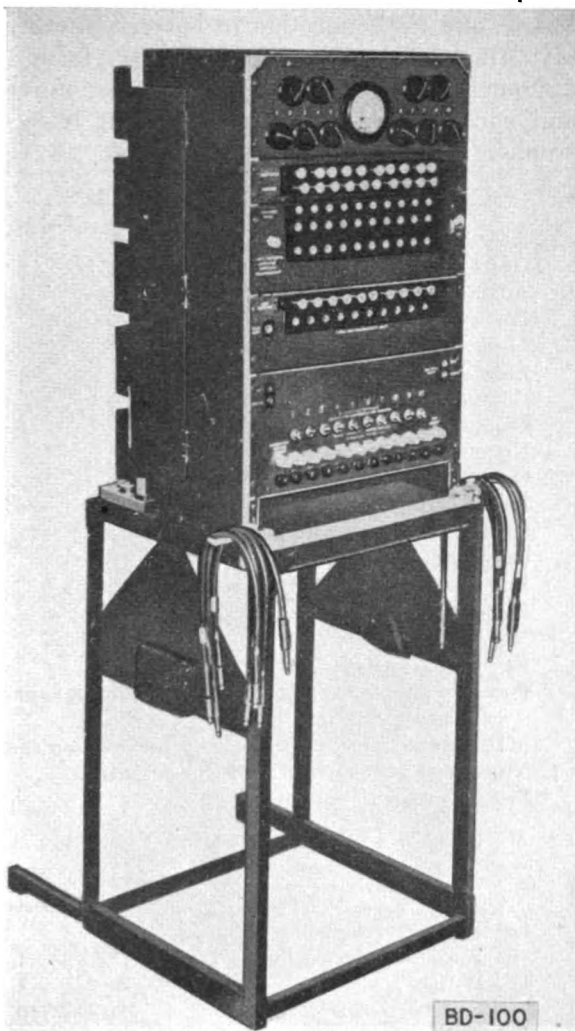


Figure 27. Switchboard BD-100.

Status: Standard. Stock No.: 4A2560. Reference: TM 11-358.

Switchboard BD-100 is composed of two principal parts: an angle iron framework and the switchboard cabinet. The angle-iron framework is used as a carrying case and supporting member for the switchboard cabinet. Each Switchboard BD-100 provides switching facilities for a maximum of 10 circuits which may be either ground-return or metallic. Line current may be supplied by the switchboard or by the distant station, or both. Switchboard BD-100 is designed to furnish

switching facilities for teletypewriter equipment operating on neutral lines. The front of the switchboard is divided into five control panels, arranged one above the other. The back of the switchboard has a hinged gate on which are mounted 10 pairs of neutral type relays. Both front and back of the switchboard are protected by steel covers during transportation.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Line circuits, neutral telegraph: 10.
- Line rheostats: 10.
- Line open key: 10.
- Answer key: 10.
- Line lamp: 10.
- Patching jacks: 20.
- Line current key: 10.
- Local bias jacks: 10.
- Line battery switches: 10.
- Blown fuse indicators: 10.
- Operator's printer circuit: 1.
- Meter key: 1.
- Bias meter: 1.
- Night-alarm circuit: 1.
- Answer release key: 10.
- Multiple jacks: 2.
- Line and local relays (Relay BK-27-A): 10.
- Line protection type: Fuses.
- Number of protected pr.: 10.
- Power requirements: 110 v dc, 1.5 amp.
- Protector panel: Integral.

b. WORKING LIMITS IN MILES:

Equipment connected to Switchboard PD-100	Type of wire	Maximum line length (mi)
Line Unit BE-77.....	W-110-B and W-143.	25
Telegraph Terminal: CF-2-A..	W-110-B and W-143.	25
Carrier Terminal: OA-4/FC....	W-110-B and W-143.	25
Telegraph Terminal: CF-2-B..	W-110-B and W-143.	12
Telegraph Terminal: CF-6....	W-110-B and W-143.	12
Telegraph Terminal: TH-1/TCC-1.	W-110-B and W-143.	12
Telegraph Terminal: OA-6/FC..	Field wire or cable.	5
Repeater TG-30 (telegraph)....	Field wire or cable.	5

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	180	311
Total volume (cu ft).....	3.9	12.8
Ship tons.....	-----	.3

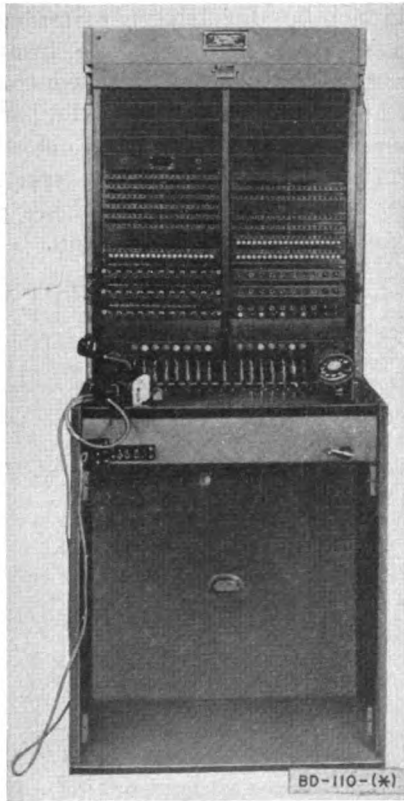


Figure 28. Switchboard BD-110.

Status: Substitute/Std. *Stock No.:* 4C10110.
Reference: TM 11-338.

Switchboard BD-110-(*), represents BD-110, BD-110-A, BD-110-B, and BD-110-C. Switchboard BD-110-(*), is a two-panel, multiple type, manually operated telephone switchboard. It has a steel frame inclosed in a trunk-type case with removable front, back, and top covers. The lower section of the switchboard contains the cords and a rack upon which are mounted the cord circuit relays, operator's telephone circuit apparatus, universal trunk circuit apparatus, and switchboard fuses. The upper section of the switchboard is occupied by the jack and signal equipment, the cabling therefrom, and the terminal panel. Lamp signals are provided for signaling on common battery lines and trunks and for magneto and common battery supervision on cord circuits. Drop signals are provided for signaling on magneto lines. Multiple jacks are provided for use when two or more switchboards are used as one installation. The answer and multiple jacks are wired to binding post on the terminal panel in the rear of the board. Rubber-jacketed cables with spade terminal strips are provided for interconnection of the switch-

boards and for connection to battery power supply, ringing current supply, and alarm and grouping circuits. The cord circuits are universal and can be used to interconnect all lines and trunks.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Auxiliary operator's telephone circuit: 1.
- Dial cord circuit: 1.
- Local battery (magneto) line circuits: 30.
- Local battery multiple jack circuits: 60.
- Common battery line circuits: 60.
- Common battery multiple jacks: 120.
- Universal trunk circuits: 4.
- Cord circuits (fully universal): 15.
- Power and heating circuit: 1.
- Conference circuit (10 jacks): 1.
- Grouping key circuit: 1.
- Emergency ringing circuit (hand generator): 1.
- Battery and ground circuit: 1.
- Night-alarm switch: 1.
- Fuse-alarm switch: 1.
- Power requirement: 40 to 56 v dc, 90-amp-hr capacity, such as 4 ea Battery BB-46.
- MDF protection type: Heat coils and carbon blocks.
- Number of protected pr: 100 on ea vertical.
- Protector panel: Frame FM-19.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
Local battery telephone:		
Without repeat coils.....	3,000	1,000
With repeat coils.....	2,000	1,000
Common battery telephone..	500	10,000
Trunk to dial office ¹	750	30,000
Trunk to manual office ¹	750	10,000

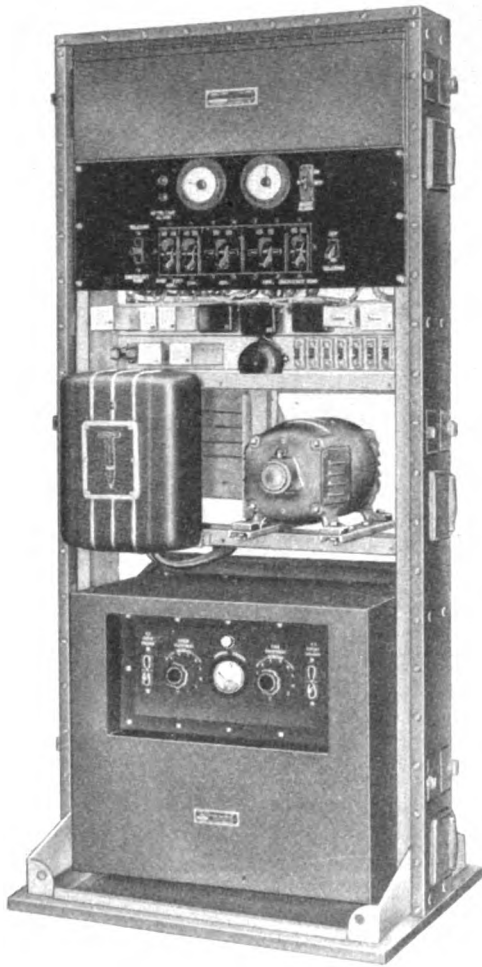
c. TRANSMISSION LOSSES AT 1,000 CYCLES.

- (1) Average losses caused by equipment in switchboard connection:
 - Magneto line to magneto line: .2 db.
 - Magneto line to common battery line: .4 db.
 - Magneto line to trunk: 1.6 db.
 - Common battery line to common battery line: .5 db.
 - Common battery line to trunk: 1.2 db.
 - Added loss for each repeat coil in circuit: .7 db.
- (2) Added losses due to operator's circuit bridge.
 - Push to talk key:
 - Normal: 1.0 db.
 - Operated: 2.5 db.
 - Monitoring key:
 - Operated: .2 db.

¹ Working limits of distant office controlling.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	740	900
Total volume (cu ft).....		45
Ship tons.....		1.1



BD-132

Figure 29. Panel BD-132.

Status: Standard. Stock No.: 3H4100-132.
Reference: TM 11-2064.

Panel BD-132 serves as a control and connecting point for 24- or 48-v battery circuits, as a source of ringing power, and as an alarm panel. This panel is equipped with meters, switches, alarm apparatus, and ringing equipment required to

supply and control power and ringing current needed for the proper operation of a tactical telephone central office.

Panel BD-132 is a steel frame box structure with front and rear panels. Mounted on the top front panel is a hinged door through which there is access to the wiring side of a cord connector panel. Just below is a meter and switch panel, a mounting plate for a night-alarm bell, and an interrupter. An emergency ringer is mounted by the side of the interrupter. Rectifier RA-91-A is built into the bottom section of the panel.

TECHNICAL CHARACTERISTICS

POWER REQUIRED:

Ac: 110-v, 60-cyc a-c supply.

Dc: 48-v, 90-amp-hr supply, such as 4 ea Battery BB-46.

POWER OUTPUT:

Rectifier output to batteries: 44 to 56 v, 12 amp.

POWER CONTROL:

Circuit breaker: 10 amp, single-pole, for emergency ringing circuit.

Circuit breaker: 15 amp, double-pole, for 110-v and 48-v switches.

POWER RINGING:

A-c equipment: Interrupter PE-250 (telering) requires 110 v, 60 cyc ac.

D-c equipment: Inverted converter requires 48 v dc, output 20 cyc ac.

CONTACT PROTECTION CIRCUIT FOR THE RINGING INTERRUPTER: 1.

NIGHT-ALARM CIRCUIT: 1.

NO-VOLTAGE ALARM CIRCUIT: 1.

FUSE-ALARM CIRCUIT: 1.

PRINCIPAL COMPONENTS

Component	Quantity
Rectifier RA-91-A.....	1
Interrupter PE-250.....	1
Inverted converter.....	1
Ammeter, 15-0-15 amp.....	1
Voltmeter, d-c, 0 to 75 v.....	1
Circuit breaker, double-pole, 15 amp.....	2
Circuit breaker, single-pole, 10 amp.....	3
Buzzer, signal, vibrating.....	1
Bell, vibrating.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	625	700
Total volume (cu ft).....	15	25
Ship tons.....		.63

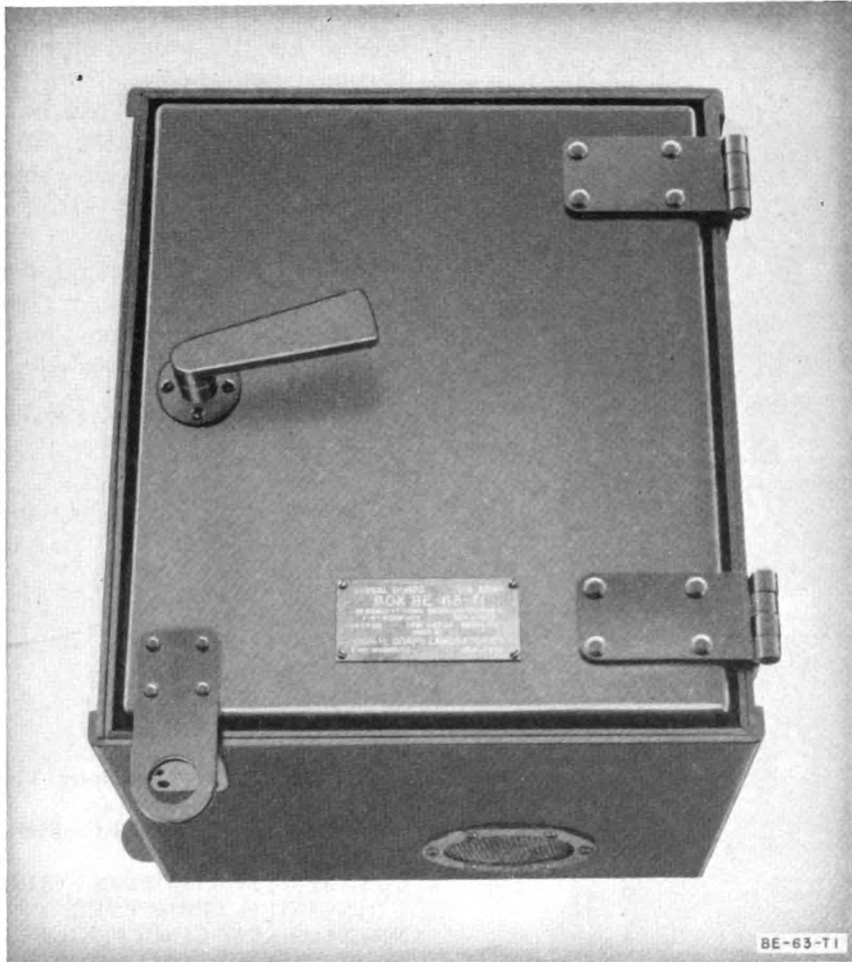


Figure 30. Box BE-63.

Status: Standard. *Stock No.:* 4B303.

Box BE-63 is a sheet-metal, black enamel-finished box equipped with a lever-type locking handle in the door. The BE-63 is designed for outdoor use as protection for fixed-plant fire-

reporting or guard telephones installed outdoors.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
16.5	12½	10¼	10½



Figure 31. Time Interval Signal, BE-65.

Status: Standard. *Stock No.:* 4H5005. *Reference.* TM 11-433.

Time Interval Signal BE-65 is a local battery-operated howler consisting of a line relay, a vibrating element, and a diaphragm mounted in a metal box. The operation of the line relay closes a local circuit which, in turn, causes the howler to operate. The BE-65 was designed for use in fire-control systems.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: 3 v dc for operation of howler, 12 v dc for operation of line relay.

Dry cells required: 2 ea Battery BA-23 for local use.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	18	25
Total volume (cu ft).....	.47	1

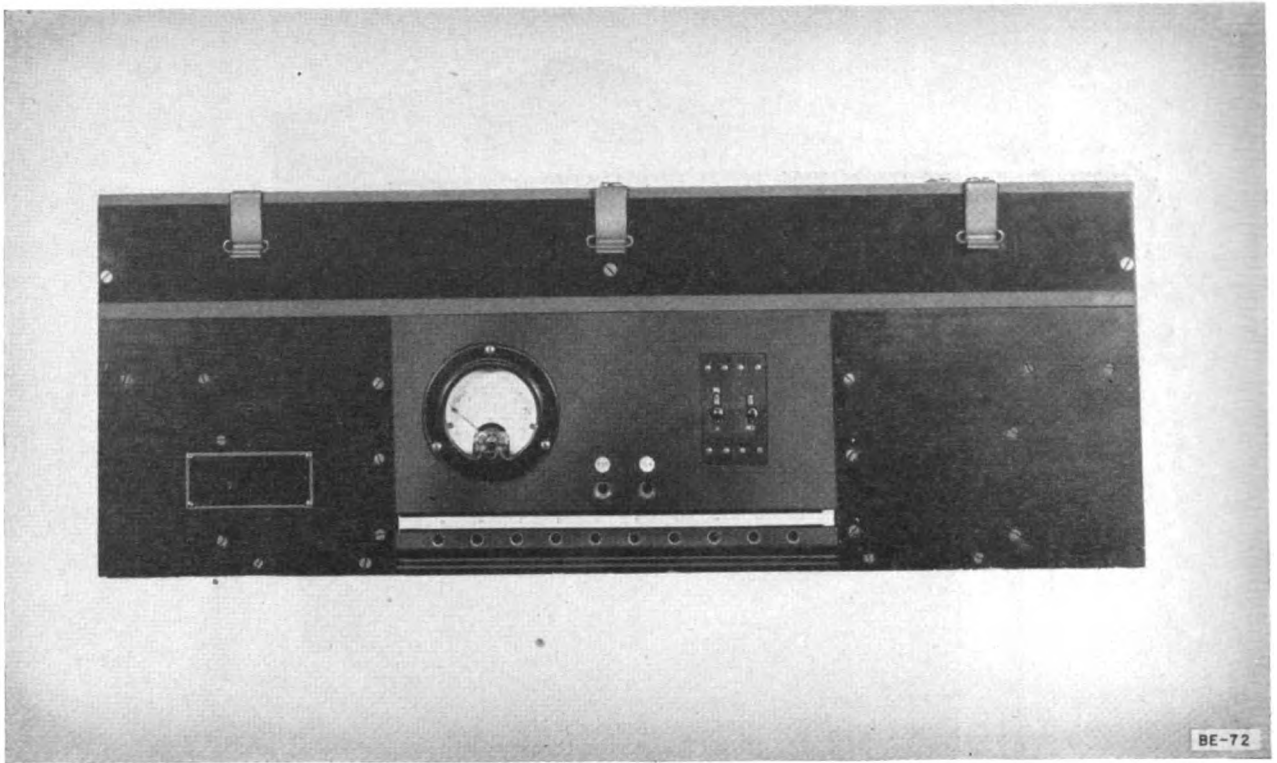


Figure 32. Cabinet BE-72, front view.

Status: Substitute/Std. *Stock No.:* 3H672.
Reference: TM 11-338.

Cabinet BE-72 is a distribution and test cabinet designed for use with Switchboard BD-80-(*) or BD-110-(*). It is mounted on top of a centrally located switchboard and serves as a distribution point for power and alarm cables. The BE-72 also serves as a test panel for the cord and line circuits of Switchboard BD-80-(*) or BD-110-(*). Four cables attached to Cabinet BE-72 are connected by plugs and receptacles to the power and alarm circuits at Panel BD-90-(*). Equipment associated with the test circuits is mounted on the face of the cabinet.

TECHNICAL CHARACTERISTICS

VOLTMETER TEST CIRCUIT: Range 0 to 100 v dc: permits testing for ground, shorts, crosses, and insulation resistance.

SWITCHBOARD TEST CIRCUIT: Used for routine test and fault location in switchboard circuits.

RINGING AND GROUND KEY CIRCUIT: Used in test covered above and, also, permits ringing on line with receiver in the off-hook condition.

VOLTMETER REVERSE KEY CIRCUIT: Used in test covered above.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	61	75
Total volume (cu ft).....	1	3.5
Ship tons.....		.8

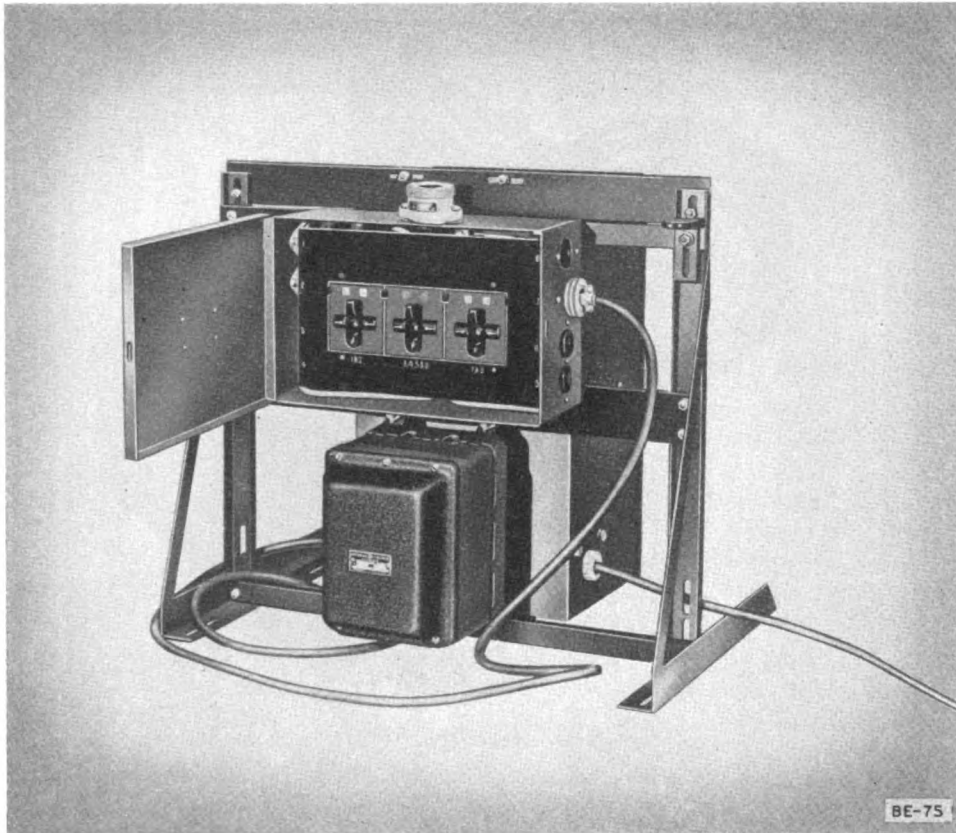


Figure 33. Cabinet BE-75, mounted on Rack FM-30.

Status: Substitute/Std. *Stock No.:* 4E1175. *Reference:* TM 11-338.

Cabinet BE-75 provides protection, control, and distribution of 110 to 120 v ac. When in use, the cabinet is mounted on Rack FM-30 with Rectifier RA-91. A cord (CD-393) is furnished for connecting Cabinet BE-75 to a local source of ac, and a cord (CD-414) is furnished as a lead from Cabinet BE-75 to the switchboard.

Cabinet BE-75 is constructed of sheet metal with a hinged cover. A receptacle mounted in the top of the cabinet provides a means of connecting the power cord from a 110-v, 60-cyc a-c source. Each side of the cabinet contains two flush base female motor sockets and two duplex outlets, for

connection of the rectifier, and other power cords. A panel mounted on the inside of the cabinet contains three circuit breakers for controlling the current to the sockets mounted on the sides of the cabinet. Cabinet BE-75 is used with Panels BD-90-(*) and BD-98-(*).

TECHNICAL CHARACTERISTICS

POWER LINE PROTECTION: 3 ea. double-pole, circuit breaker switch rated at 25 amp.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	25	30.5
Total volume (cu ft).....	.5	1.7
Ship tons.....		.04



Figure 34. Line Unit BE-77-A.

Status: Standard. *Stock No.:* 4TBE77A. *Reference:* TM 11-359.

Line Unit BE-77-(*) represents BE-77-A and BE-77-B. Line Unit BE-77-(*) is an electrical device designed for use as part of Army tactical teletypewriter sets which transmit and receive d-c, neutral-type line signals. Line units make the necessary connections between a d-c power source, a wire line circuit, and the teletypewriter equipment. It repeats teletypewriter signals transmitted to, and received from, the line into the teletypewriter receiving mechanism, measures and adjusts line current, adjusts the quality (bias) of the received signals, measures voltage of the d-c power source, and measures the bias in the line signals.

Line Unit BE-77-(*) is a self-contained unit, mounted in a sheet-steel housing. All parts of these two models are electrically and mechanically interchangeable except the meter keys, which are electrically but not mechanically interchangeable. For these models a separate bias meter and voltmeter are unnecessary because circuits for measuring bias and power supply voltages are built into them. Binding posts for the line and ground connections, binding posts and jacks for connection to teletypewriter equipment, the line

fuse and blown fuse indicator, line rheostat, meter, and meter keys are mounted on the top cover of the line unit. Access to the line relay and switch panel is by means of a door on the front of the housing. The bias circuit adjustment and relay and line current switches are mounted on the switch panel. The power cord, for connection to the d-c power source, is located at the rear of the housing.

TECHNICAL CHARACTERISTICS

LINE CIRCUIT OPERATION: Neutral, 60 ma.

Line current measuring circuit: 1.

Bias adjusting circuit: 1.

Bias measuring circuit: 1.

VOLTAGE MEASURING CIRCUIT (d-c power source): 1.

PROTECTION TYPE: Fuse ($\frac{1}{4}$ amp).

POWER REQUIRED: 115 v dc (when switch is in local current supply position).

PRINCIPAL COMPONENTS

Component	Quantity
Basic Line Unit BE-77-(*)	1
Line relay	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	9.3	25.8
Total volume (cu ft)	.15	.83
Ship tons		.002

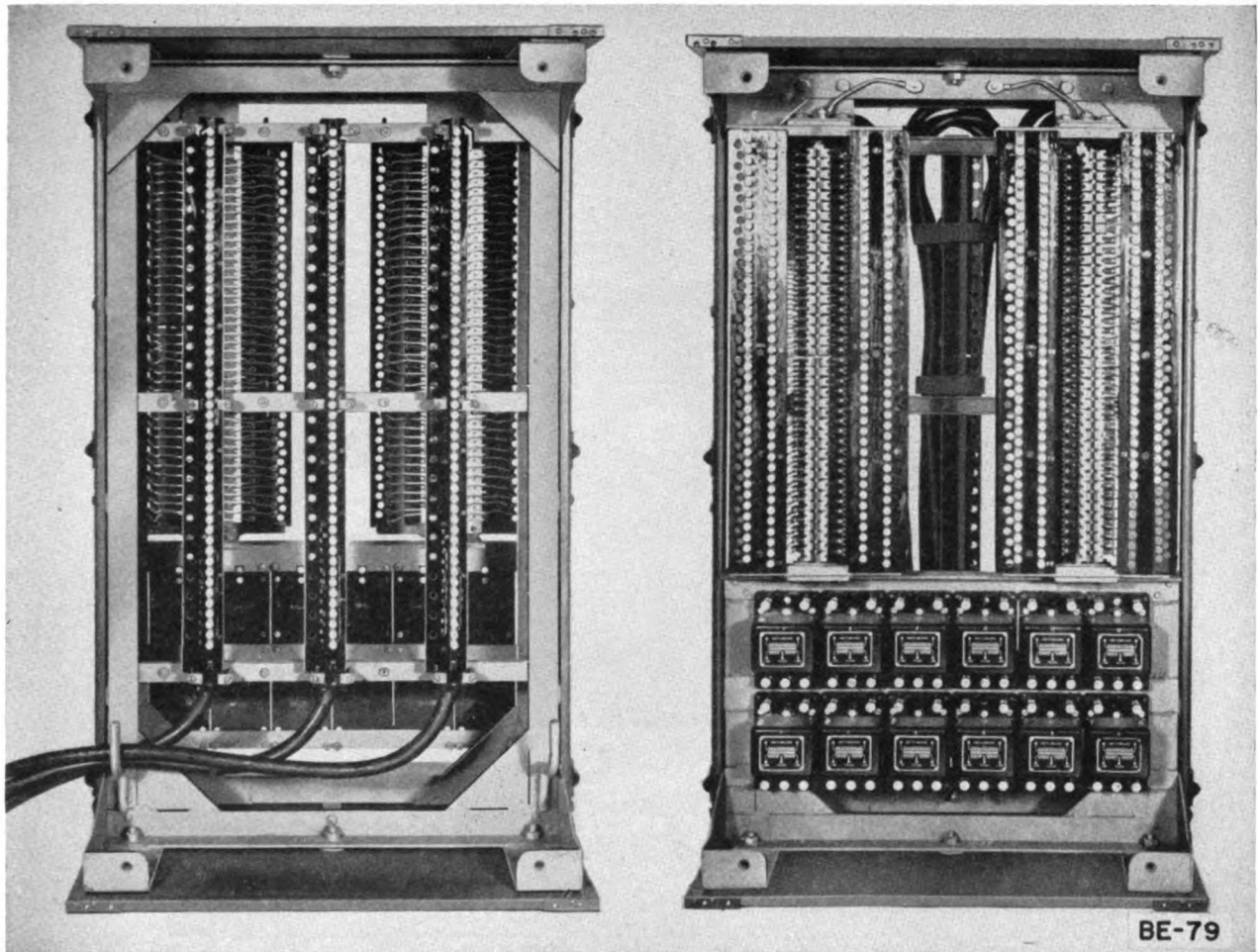


Figure 35. Cabinet BE-79, Line Side and Switchboard.

Status: Substitute/Std. *Stock No.:* 4E1179.
Reference: TM 11-340.

Cabinet BE-79 is a main distributing frame designed for use with one Switchboard BD-89-(*). It is equipped with protector blocks and heat coils which are connected to terminal strips. Binding posts are provided for the incoming lines and for cross-connecting so that all such connections can be made in the field without soldering. The connections from Cabinet BE-79 to Switchboard BD-89-(*) are made with rubber-jacketed cables (Cord CD-298) equipped with binding post cable connectors at the cabinet and spade terminal connectors at the switchboard end.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: None.
LINE PROTECTION: Heat coils and open space cut-outs (carbon blocks).
NUMBER OF PROTECTED PR: 80.
SIMPLEX COILS: 12 Coil C-161 (not connected into any line circuit).
INTERCONNECTION OF CABINET AND SWITCHBOARD: 3 ea, 25-pair, rubber-jacketed cable (Cord CD-298).

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	300	670
Total volume (cu ft)-----	10.5	34
Ship tons-----	-----	.85

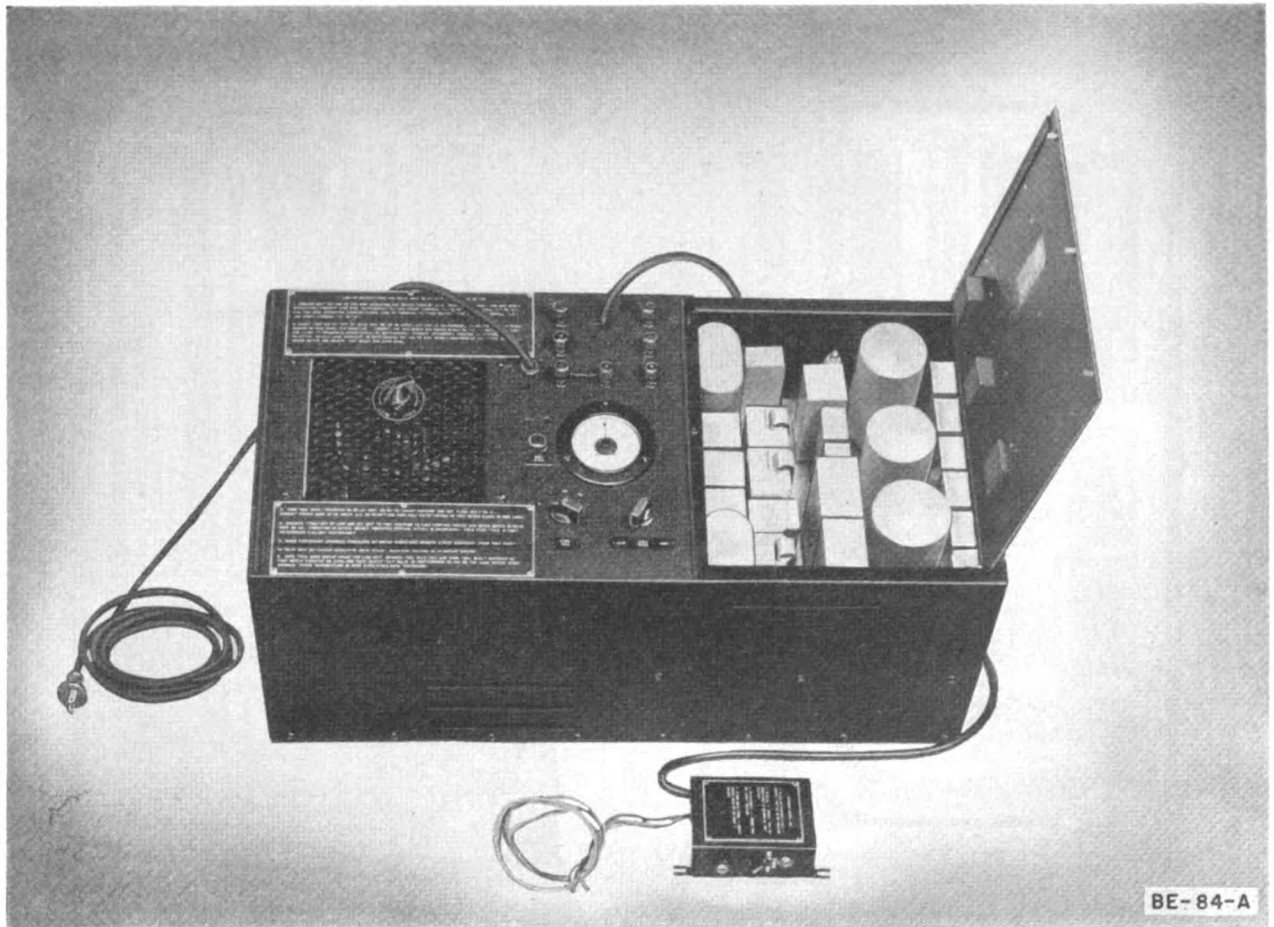


Figure 36. Relay Unit BE-84-A.

Status: Standard. Stock No.: 2Z7584. Reference: TM 11-343.

Relay Unit BE-84-A is a portable unit assembled in a compact metal cabinet with terminals, rheostat, key, switches, and meter exposed on the top panel. A durable wooden carrying case equipped with shockproof material serves as protection during transit. A key and lamp unit, supplied with wires for connection to terminals of Switchboard BD-100, is attached to Switchboard BD-100 during operation. The key and lamp unit is permanently connected to Relay Unit BE-84-A by an 8-foot cord. It provides a means of signaling and supervising between the commercial TWX operator and the operator of Switchboard BD-100.

The purpose of Relay Unit BE-84-A is to

change the 60-ma neutral-type trunk circuit of Telegraph (teletypewriter) Switchboard BD-100 to a type B polarisential circuit for transmission and termination on the commercial type telegraph (teletypewriter) switchboard.

TECHNICAL CHARACTERISTICS

OPERATION:

Line side: Type B polarisential.

Local side: Neutral-type, 60 ma.

Speed of operation: 60 speed (368 opm).

Power required: 115 v, 50 to 60 cyc ac; 60 w, 115 v dc for supervisory relay and loop circuit.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	87	132
Total volume (cu ft).....	1.6	4.5
Ship tons.....		.11

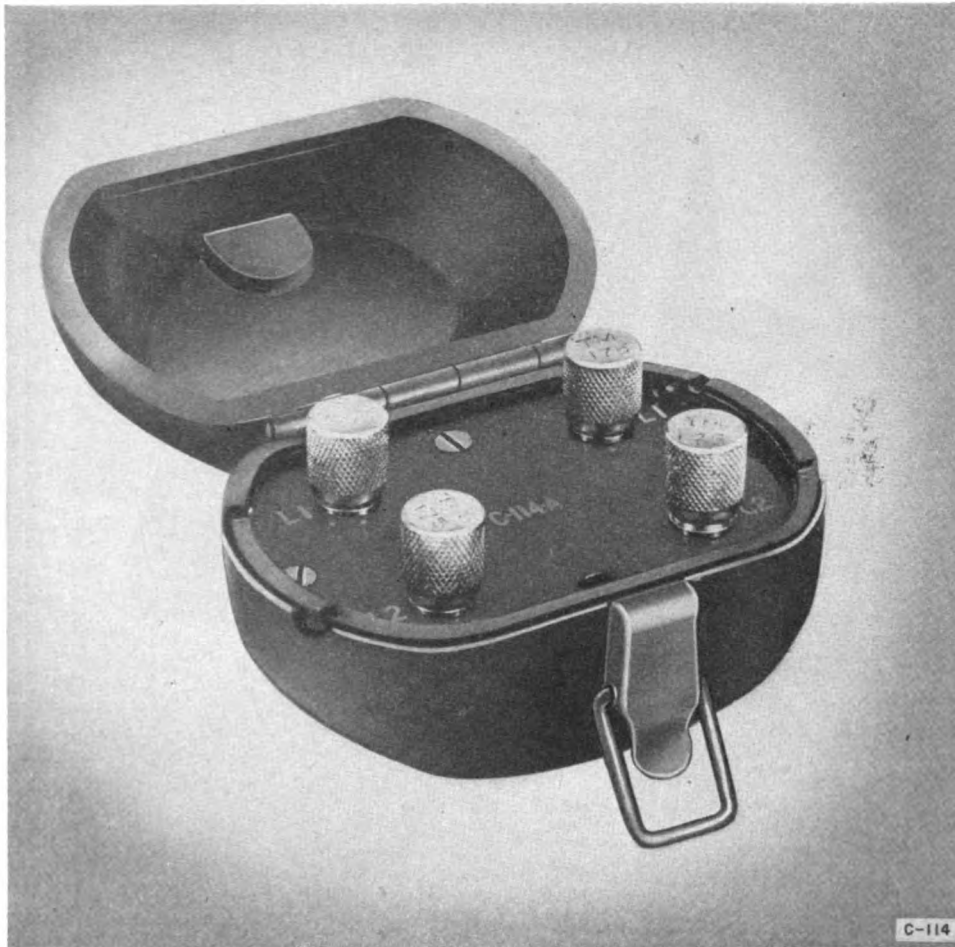


Figure 37. Coil C-114-A, loading.

Status: Limited/Std. Stock No.: 3C114 (C-114) and 3C114A (C-114-A). Reference: FM 24-20.

Coil C-114-(*) represents Coil C-114 and C-114-A. Coil C-114-(*) is a loading coil designed to add lumped inductance into field wire telephone line circuits, thereby increasing their talking range. The C-114 is contained in an aluminum alloy case and the C-114-A is contained in a phenolic plastic case.

The covers of Coil C-114-(*) are hinged along one side and are held closed by a latch. A rubber gasket, designed to make a watertight seal, is attached to the case of the coil.

TECHNICAL CHARACTERISTICS

INDUCTANCE: 88 mh.

D-C RESISTANCE: 8.4 ohms.

TALKING RANGE IN MI, WITH COIL C-114 OR C-114-A AND THE WIRE IN A WET CONDITION:

Wire	Spacing (mils)	With coil	Without coil
W-110-B.....	1	22	10.5
W-143.....	$\frac{1}{2}$	79	23.8
WD-1()/TT, WD-14()/ TT.....	1	30	12.5

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	1.5	3.6
Total volume (cu ft).....	.014	.09



Figure 38. Coil C-161.

Status: Standard. *Stock No.:* 3C161. *Reference:* FM 24-20.

Repeat Coil C-161 is a 1:1 ratio ring-through transformer with the line-side winding center-tapped for simplex circuit operation. The ends of one winding are brought out to two terminals marked LINE. The ends of the other winding are brought out to two terminals marked SWITCHBOARD. The midpoint of the line-side winding is brought out to a fifth terminal marked TELE.

Coil C-161 can be used to provide additional

telephone or telegraph channels on existing wire facilities by means of simplex, phantom, or simplex-phantom combinations. Coil C-161 is part of Switchboards BD-71, BD-72, and BD-91 and Panels BD-89, BD-97, and BD-132.

TECHNICAL CHARACTERISTIC

1,000-CYCLE LOSSES: .7 db per coil in circuit.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	3	6.1
Total volume (cu ft).....	.03	.14

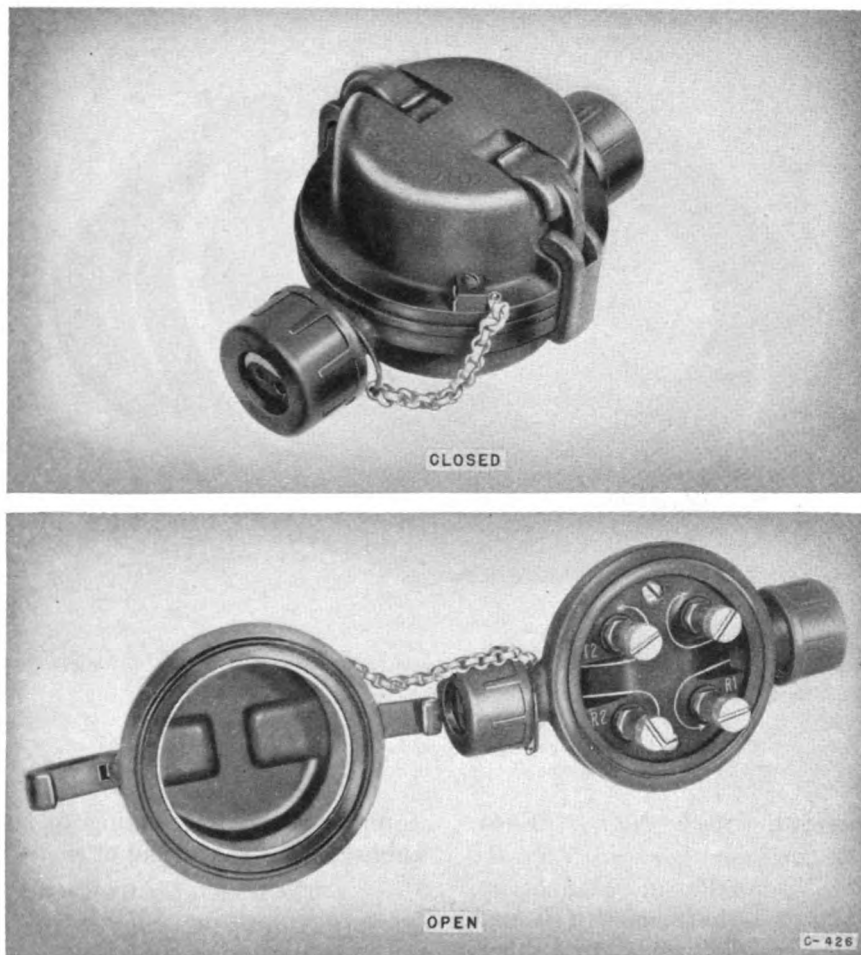


Figure 39. Loading Coil C-426.

Status: Standard. Stock No.: 3C300-426. Reference: FM 24-20.

Coil C-426 is a loading coil designed to add lumped inductance into field wire telephone line circuits, thereby increasing their talking range. It also serves as an access terminal connector for testing purposes. It is arranged so that connections can be made to include or exclude the loading coil.

Loading Coil C-426 is housed in an oval-shaped, die-cast aluminum case. Four binding post terminals are provided to connect the incoming and outgoing pair of wires. A removable cover permits access to the binding post terminals for connection or testing purposes. A synthetic rubber gasket for the cover and synthetic rubber

bushings in the wire entrances are provided as a moisture seal.

TECHNICAL CHARACTERISTICS

INDUCTANCE: 44 mh.

D-C RESISTANCE: 4.2 ohms.

TALKING RANGE IN MILES, WITH COIL C-426 AND THE WIRE IN A WET CONDITION:

Wire	Spacing (mile)	With coil	Without coil
W-110-B-----	1	19.3	10.5
W-143-----	$\frac{1}{2}$	81.6	23.8
WD-1()/TT-----	1	22	12.5
WD-14()/TT-----	1	22	12.5

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)-----	1.6	3.5
Total volume (cu ft)-----	.018	.15

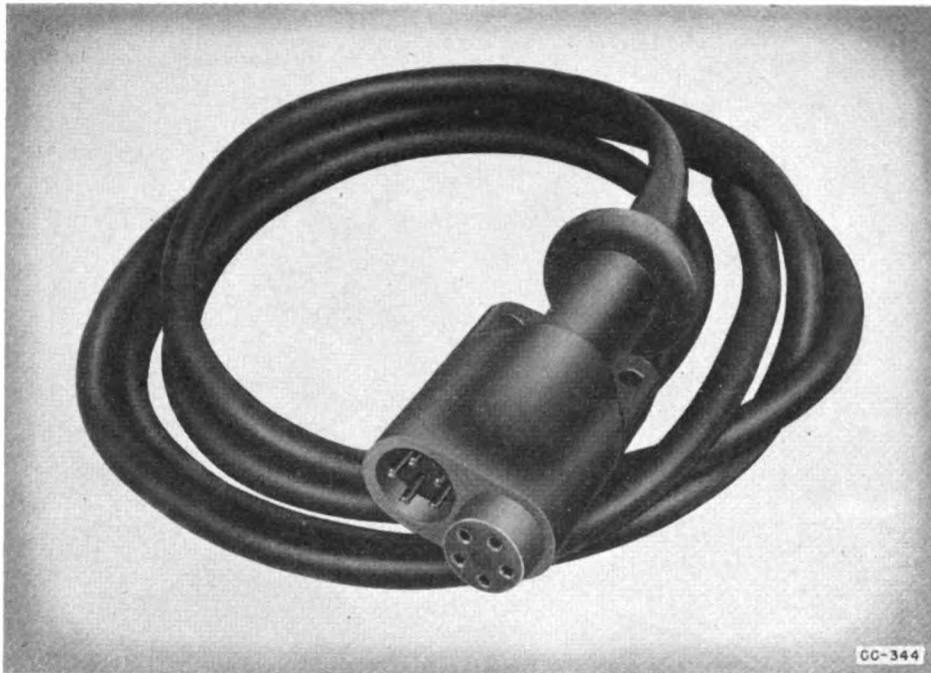


Figure 40. Cable Stub CC-344.

Status: Limited/Std. Stock No.: 3E344.

Reference: TM 11-371.

Cable Stub CC-344 is a short length (10 feet) of 5-pair, color-coded, rubber-insulated, rubber-jacketed cable terminated at one end in Plug PL-163. The free end may be fanned out and connected to suitable terminals.

Cable Stub CC-344 furnishes a means of terminating Cable Assemblies CC-345 and CC-355 so that they can be connected to terminals or

equipment without having to cut and strip the rubber jacket at the end of the cable assemblies.

TECHNICAL CHARACTERISTICS

PHYSICAL DATA:

- Size of conductors: #19 AWG annealed copper.
- Number of conductors: 10.
- Outside diam of cable: .5 in.
- Min tensile strength: 425 lb.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb.)	3.2	4.9
Total volume (cu ft)	.12	.26

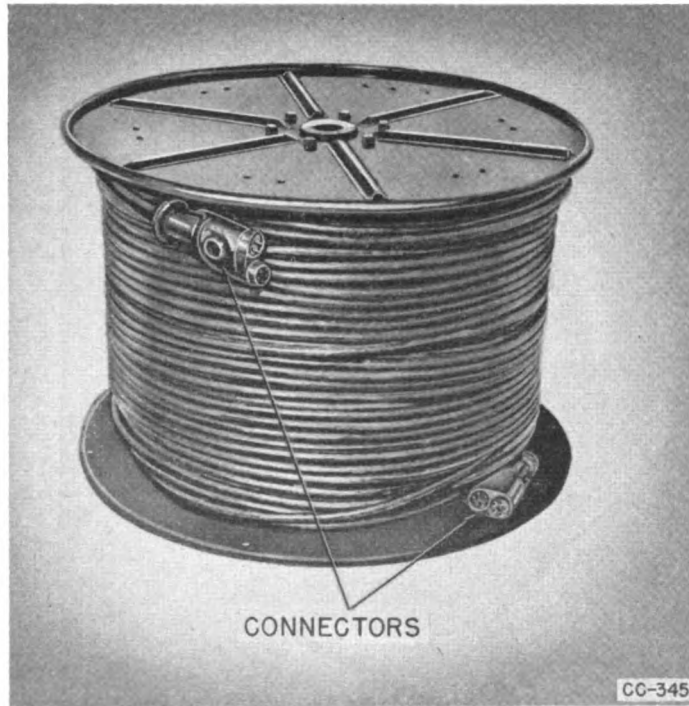


Figure 41. Cable Assembly CC-345 on Reel DR-7.

Status: Limited/Std. Stock No.: 3E345. Reference: TM 11-371.

Cable Assembly CC-345 is a 5-pair, color-coded, rubber-insulated, rubber-jacketed cable equipped with a connector, Plug PL-163, on each end. The cable conductors are connected identically to the plugs and sockets of each connector. The rubber compound of each connector is vulcanized securely to the cable jacket. Cable Assembly CC-345 comes in different lengths, and each length has a different Signal Corps stock number. The stock numbers of the different lengths are—

Length (ft.)	Signal Corps stock No.
100	¹ 3E345-100
200	¹ 3E345-200
500	¹ 3E345-500
1,000	² 3E345-1000
2,640	³ 3E345-2640

¹ Supplied in coils.

² Supplied on Reel DR-5.

³ Supplied on Reel DR-7.

Cable Assembly CC-345 normally is used as entrance cable in congested areas around Division (or higher) Headquarters or construction centers.

It may be used for distribution cable at semi-permanent installations or for short trunks between switchboards in the same general area.

TECHNICAL CHARACTERISTICS

a. PHYSICAL DATA:

Size of conductors: #19 AWG annealed copper.

Number of conductors: 10.

Outside diam of cable: .5 in.

Min tensile strength: 425 lb.

Conductor resistance, maximum, per loop mile, at 68° F: 92.0 ohms.

b. TRANSMISSION DATA (nonstabilized wire facility):

Attenuation per mi at 1,000 cps:

Nonloaded: 1.6 db.

Loaded:

5280-44: .9 db.

5280-88: .76 db.

WEIGHT AND VOLUME

Length (ft) -----	Unpacked			Export pack		
	100	200	500	100	200	500
Total weight (lb) ..	15	30	75	21.6	41	70
Total volume (cu ft)	---	---	---	.76	1.42	2.5

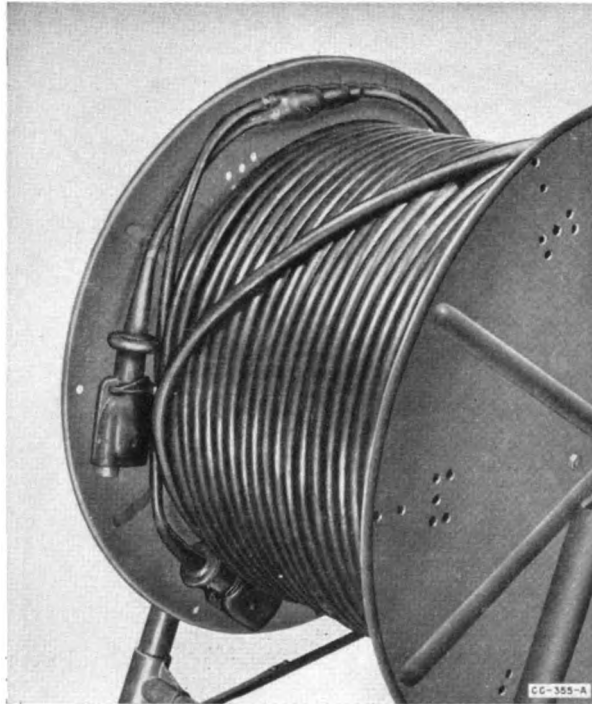


Figure 42. Cable Assembly CC-355-A.

Status: Limited/Std. *Stock No.:* 3E355. *Reference:* TM 11-371.

Cable Assembly CC-355-A is a 10-pair, color-coded, rubber-insulated, rubber-jacketed cable equipped with two staggered connectors (Plug PL-163) on each end. The conductors connected to the plugs and sockets of the long conductor at one end are then connected identically to the plugs and sockets of the short conductor at the other end. The rubber compound of the two connectors on each end is vulcanized securely to the cable jackets of two short pieces of 5-pair cable. The jackets of the short pieces of 5-pair cable are vulcanized at their opposite ends to the jacket of a 10-pair cable in a pothead, where the two 5-pair cables are spliced to the 10-pair cable. Cable Assembly CC-355-A comes in different lengths, and each length has a different Signal Corps stock number. The stock numbers of the different lengths are—

<i>Length (ft.)</i>	<i>Signal Corps stock No</i>
100	¹ 3E355A-100
200	¹ 3E355A-200
500	¹ 3E355A-500
1,000	² 1B1535-1000

¹ Supplied in coils.

² Supplied on Reel DR-7.

Cable Assembly CC-355-A normally is used as entrance cable in congested areas around Division (or higher) Headquarters or construction centers. It may be used for distribution cable at semipermanent installations or for short trunks between switchboards in the same general area.

TECHNICAL CHARACTERISTICS

a. PHYSICAL DATA:

Size of conductors: #19 AWG annealed copper.

Number of conductors: 20.

Outside diameter of cable: .7 in.

Min tensile strength: 750 lb.

Conductor resistance, maximum, per loop minimum, at 68° F: 92.0 ohms.

b. TRANSMISSION DATA (Nonstabilized wire facility):

Attenuation per mi at 1,000 cps:

Nonloaded: 1.6 db.

Loaded:

5280-44: .9 db.

5280-88: .76 db.

WEIGHT

	<i>Lengths (ft.)</i>		
	<i>100</i>	<i>200</i>	<i>500</i>
Unpacked (lb) -----	30	60	150
Export pack (lb) -----	34	68	170

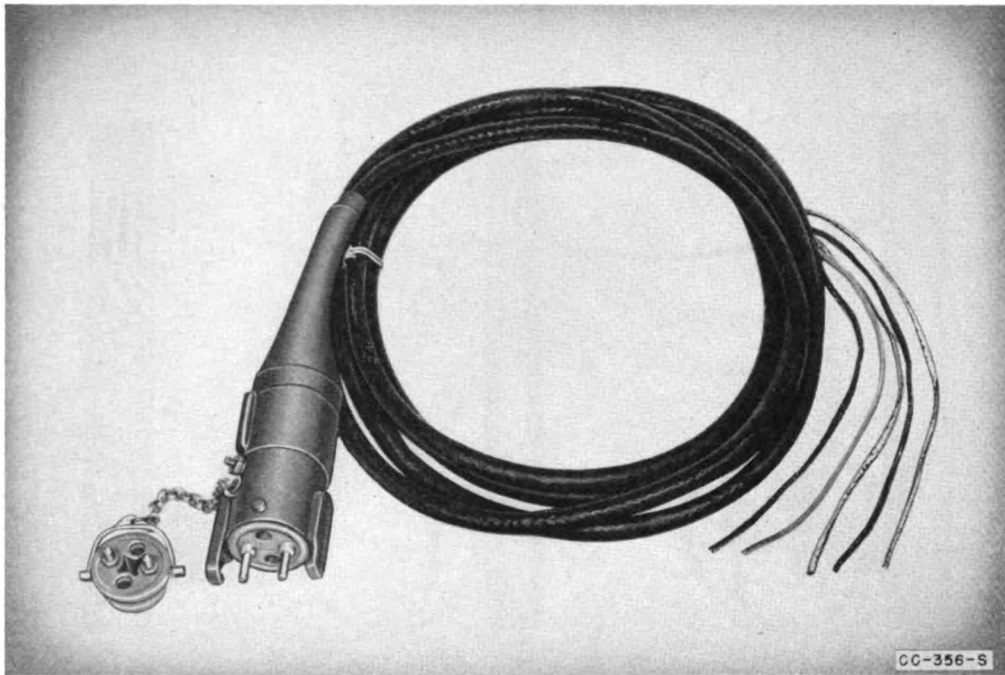


Figure 43. Cable Stub CC-356.

Status: Standard. *Stock No.:* 3E356. *Reference:* TM 11-369.

Cable Stub CC-356 is a short length (12 feet) of 4-wire, rubber-insulated, rubber-jacketed cable terminated at one end in a regular spiral-four cable connector including loading coil. The free end of the stub may be fanned out for connection to suitable terminals. A distinctively colored wire is connected to the shield of the cable and brought out at the free end of the cable stub.

Cable Stub CC-356 furnishes a means of terminating Cable Assembly CC-358 so that it can be connected to terminals or equipment without having to cut and strip the rubber jacket at the end of the cable assembly.

TECHNICAL CHARACTERISTICS

a. PHYSICAL DATA:

Size of conductors: Ea conductor is made up of 7 strands of annealed copper, .015 in. in diam, equivalent in over-all conductivity to #18 AWG.

Number of conductors: 4 conductors arranged in a star quad.

Outside diam of cable: .42 in.

Outside diam of connector: 2.25 in.

Tensile strength of cable: 500 lb.

Breaking strength at connectors: 500 lb.

b. ELECTRICAL DATA:

Inductance of loading coil: 6 mh.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	2.7	6.42
Total volume (cu ft).....		.22

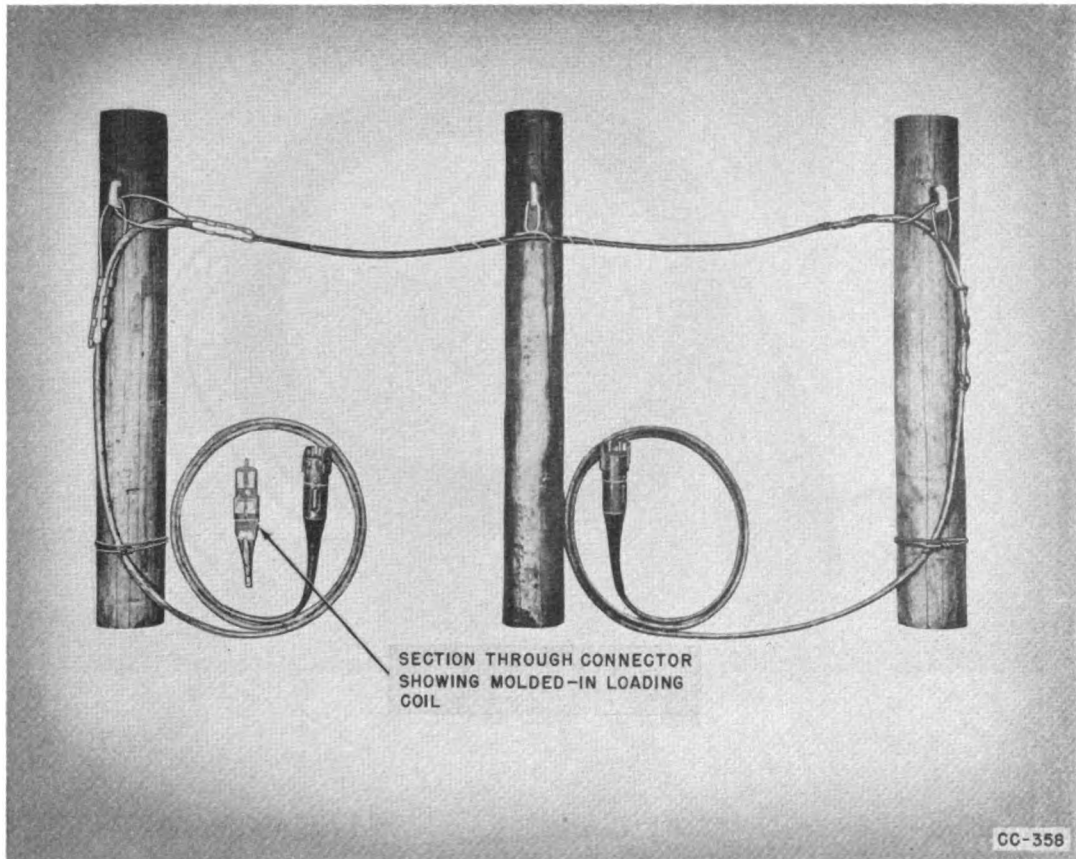


Figure 44. Cable Assembly CC-358.

Status: Standard. *Stack No.:* 3E358. *Reference:* TM 11-369.

Cable Assembly CC-358 was designed as a transmission line for Carrier System CF-1-(). It is a ¼-mile length of four conductors, rubber-insulated, spirally twisted, and covered with a shielding tape of metalized paper, which, in turn, is covered with a served paper wrapping. Over the paper wrapping there is a steel wire braid to give mechanical strength; the outside cover of the cable is a heavy rubber jacket. Cable Assembly CC-358 is terminated at both ends in specially designed connectors which include a loading coil molded inside the rubber jacket. When two connectors are plugged together, the circuits are connected between the two cable lengths and all wires are loaded.

TECHNICAL CHARACTERISTICS

a. PHYSICAL DATA:

Size of conductors: Each conductor is made up of 7 strands of annealed copper, .015 in. in diam, equivalent in over-all conductivity to #18 AWG.

Number of conductors: 4 conductors arranged in a star quad.

Outside diam of cable: .42 in.

Outside diam of connector: 2.25 in.

Tensile strength of cable: 500 lb.

Breaking strength at connectors: 500 lb.

b. ELECTRICAL DATA:

D-c resistance per pr for ¼-mile loop: 18 ohms.

D-c resistance of loading coil: 1.5 ohms.

D-c resistance per loop mile including loading coil: 77 ohms.

Inductance of loading coils: 6 mh.

c. TRANSMISSION DATA:

Attenuation per mile in db at:—

1 kc	8 kc	11 kc
.75	.85	.95

Loading system: 1320-6.

1,000-cyc impedance, ohms: 475-j105.

WEIGHT AND VOLUME

	Unpacked	Export pack
Length (mi).....	1	1
Total weight (lb).....	540	700
Total volume (cu ft).....		19.2
Ship tons.....		.48

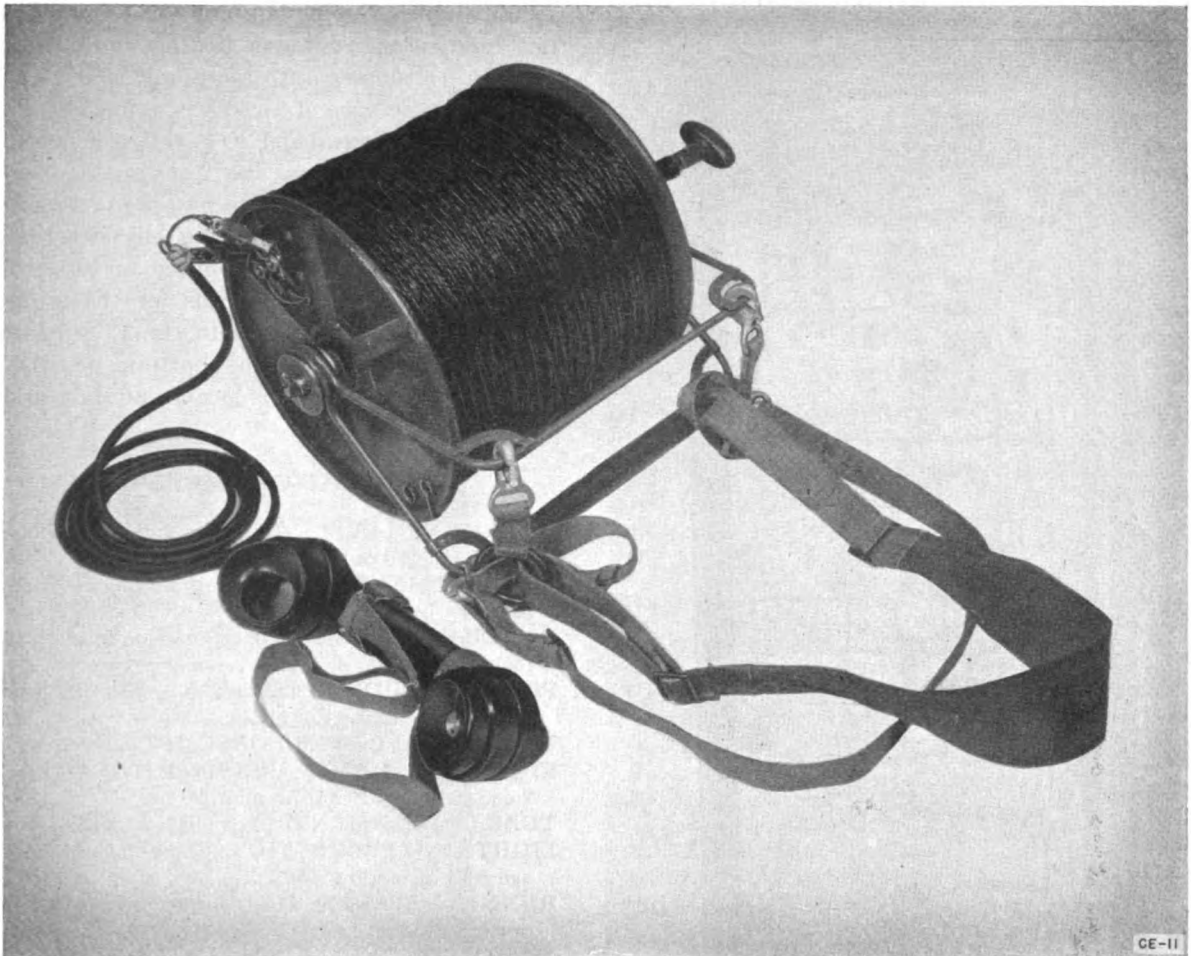


Figure 45. Reel Equipment CE-11.

Status: Standard. *Stock No.:* 6H6111. *Reference:* TM 11-2250.

Reel Equipment CE-11 is a lightweight, portable wire-laying unit designed to be carried by one man. It consists of a Reel DR-8, carrying handles for the reel which incorporate the support bearings, and a square-shaft axle, a sound-powered telephone, and carrying straps.

Reel Equipment CE-11 is used primarily by the Infantry for laying assault wire over short distances.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Reel RL-39.....	1
Strap ST-33.....	1
Handset TS-10.....	1

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	2	2.5
Total volume (cu ft).....		1

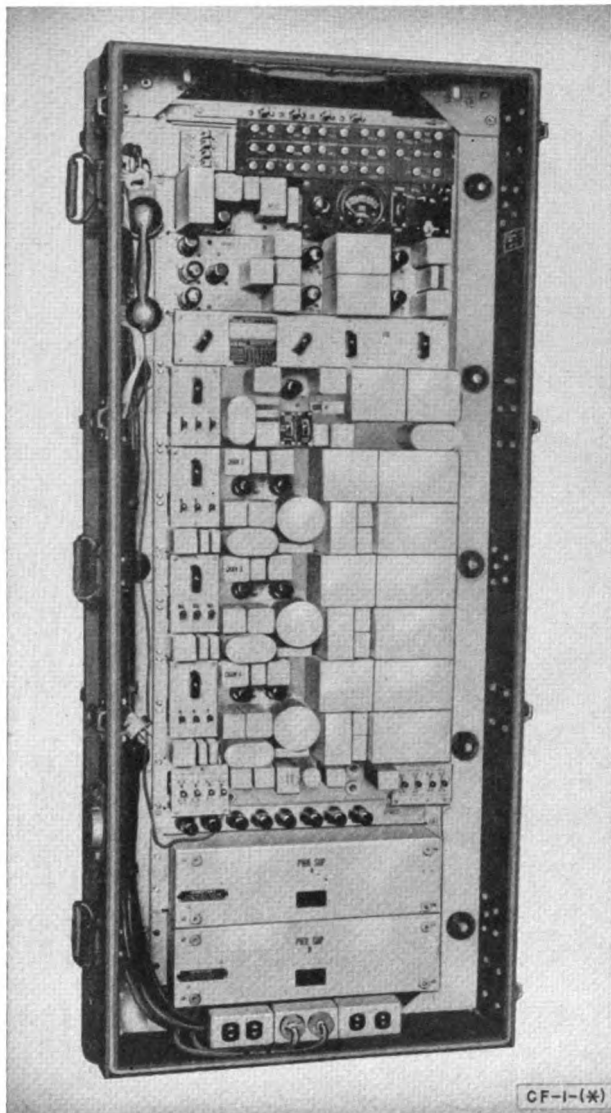


Figure 46. Telephone Terminal CF-1-(B) (carrier).

Status: Standard. Stock No.: 4B8361A (CF-1-A) and 4B8361B (CF-1-B). Reference: TM 11-341.

Telephone Terminal CF-1-(*) represents CF-1-A and CF-1-B. Telephone Terminal CF-1-(*) is a transportable, four-channel carrier telephone terminal designed for use on spiral-four cable to provide high quality, long distance, tactical communications. It provides one voice and three carrier channels, one d-c signaling, and one d-c telegraph circuit on the two simplex circuits of the spiral-four cable. One or more of the telephone channels may be used for v-f telegraph (CF-2-(*)). Each telephone channel requires

1,000/20-cycle ringing equipment. The CF-1-(*) has built-in transmission testing equipment and automatic transfer from a-c power source to storage battery in case of a-c power failure.

Telephone Terminal CF-1-(*) is enclosed in a wooden case with removable front and back covers. Three carrying handles are provided on each side of the case. Units requiring adjustments such as dials, keys, etc., are mounted on the front of the panels. The power cords for the a-c power supply and for connection to the 12-volt storage battery extend from the bottom of the bay. The binding post panel is located at the top of the rack.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS: Normally 0 dbm; may be raised to +5 or +10 dbm.
- LOCATION IN SYSTEM: At terminating ends (S-4 system).
- RANGE¹: 150 mi. (cable on ground or in air); 400 mi. (cable buried).
- POWER REQUIRED: 115 to 230 v, 50 to 60 cyc ac or 12-v storage battery.
- NORMAL A-C POWER CONSUMPTION: 61 w.
- STAND-BY POWER, CONSUMPTION-CAPACITY: 2 ea. Battery BB-55, 7.5 amp, 20 hr.
- TUBE COMPLEMENT: 10 ea 6SJ7, 2 ea 6V6.
- LIGHTNING PROTECTION: Carbon blocks and drainage coils at binding posts.
- RUNNING SPARES: Tubes, protectors, fuses, and vibrator.
- MONITORING: EE-8-(*) (CF-1-A)²; handset (CF-1-B).
- LEVEL INDICATION: DbM meter³, 1,000-cyc tone source.
- HOUSING: Rack and panels mounted in wooden case.
- CARRIER FREQUENCIES: Channel 2 (5,900 cps); channel 3 (8,850 cps); channel 4 (11,800 cps).
- LINE TERMINATIONS: 4-wire only, 600-ohm impedance.
- DROP AND AND LOOP TERMINATIONS: 2-wire (CF-1-A)²; 2- or 4- wire (CF-1-B).
- SIGNAL AND ALARM CIRCUIT: Uses one of the simplex circuits.
- TOOL AND TEST SETS REQUIRED: TE-123 and IE-53; part of TC-21-(*).

¹ Ranges given assume CF-3 repeaters at 25-mile intervals. Range without repeaters is about 45 miles.

² CF-1-B differs from CF-1-A in that it includes a built-in handset and the telephone drops may be either 2-wire or 4-wire.

³ Built-in signal generator supplies test tone which may be impressed on any channel for line-up purposes.

WEIGHT AND VOLUME

	Unpacked		Export pack	
	CF-1-A	CF-1-B	CF-1-A	CF-1-B
Total weight (lb).....	475	480	735	740
Total volume (cu ft).....	20.5	20.5	43.8	43.8
Ship tons.....			1.1	1.1

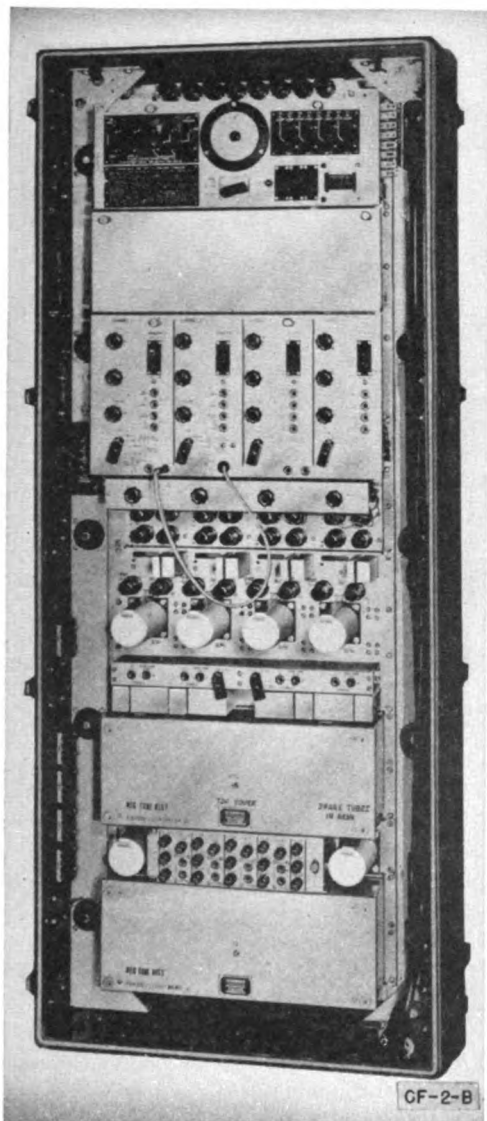


Figure 47. Telegraph Terminal CF-2-B (carrier).

Status: Standard. Stock No.: 4A2892. Reference: TM 11-355B.

Telegraph Terminal CF-2-(*) represents CF-2-A and CF-2-B. Telegraph Terminal CF-2-(*) is a transportable, 4-channel carrier telegraph terminal designed for use on any normal telephone channel. It is used as a 4-channel, v-f carrier telegraph system which uses eight frequencies in the range from 500 to 2,050 cycles. The system provides two-way transmission, each telegraph channel using two different carrier frequencies for the two directions of transmission. The system is designed for operation over one channel of a 4-channel telephone system by using Telephone Terminal CF-1-(*) (usually channel 3). When

used with this system, the telegraph terminals are connected on a 2-wire basis to the telephone terminals at each end of the carrier telephone circuit.

Telegraph Terminal CF-2-A is made up of two bays of equipment of two channels each. Telegraph Terminal CF-2-B provides the equipment for four channels in a single bay. The general design of the circuits of the two types of terminals is the same, and may operate a 2-wire, 4-channel system with a CF-2-B at one end and a CF-2-A at the other end. Telegraph Terminal CF-2-B, however, is arranged for 4-wire as well as 2-wire operation. A single CF-2-A bay can be operated only on a 2-wire basis. In addition to using it with the 4-channel system, Telegraph Terminal CF-2-B may be operated over any 2-wire or 4-wire circuit that meets the requirements for good telephone service.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normally 10 dbm; may be raised to 0 dbm for special cases.

LOCATION IN SYSTEM: At termination of telephone channel.

RANGE: Dependent on telephone facility; is operable over 25-dbm not loss.

POWER REQUIRED: 115 to 230 v, 50 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 425 w (CF-2-A); 276 w (CF-2-B).

STAND-BY POWER, CONSUMPTION-CAPACITY: None provided.

TUBE COMPLEMENT:

CF-2-A: 12 ea 6SJ7, 4 ea 6V6, 8 ea 394A.

CF-2-B: 20 ea 6SJ7, 4 ea 394A.

LIGHTNING PROTECTION: Carbon blocks at all line and loop binding posts.

RUNNING SPARES: Tubes, protectors, fuses, vibrator, and relays.

MONITORING: Monitoring printer jacks on all channels. LEVEL INDICATION: All measurements covered.¹

HOUSING: Rack and panels mounted in wooden case.

CARRIER FREQUENCIES: 8 tones (595 to 1,955) spaced 170 cyc.

LINE TERMINATION: 2-wire or 4-wire telephone line.

DROP AND LOOP TERMINATION: 2-wire or ground return.²

TOOL AND TEST SETS REQUIRED: Relay adjusting tools; part of CF-2-(*).

¹ Send and receive loop current, send bias, received current, relay test, power supply voltages, and audio output level.

² The following loop circuits may be accommodated: full- and half-duplex to either positive or negative battery, half-duplex polar and full-duplex two-path polar.

WEIGHT AND VOLUME

	Unpacked		Export pack	
	CF-2-A	CF-2-B	CF-2-A	CF-2-B
Total weight (lb).....	1,060	560	1,460	760
Total volume (cu ft).....	44	22	84	42
Ship tons.....			2.1	1.1

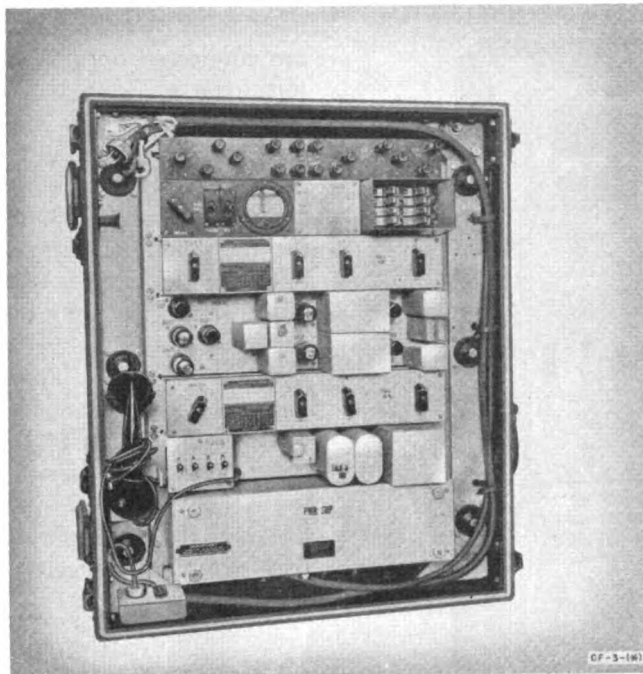


Figure 48. Repeater CF-3-(A) (carrier).

Status: Standard. *Stock No.:* 4B3203. *Reference:* TM 11-341.

Repeater CF-3-(*) represents CF-3 and CF-3-A. Repeater CF-3-(*) is a transportable, 4-wire carrier repeater designed for use at intermediate points in a spiral-four cable carrier system. It amplifies simultaneously all transmission present on the physical pairs of a spiral-four cable when used at intermediate points in a multichannel carrier system. The CF-3-(*) is arranged for d-c signaling and d-c telegraph operation on the two simplexes. It has built-in transmission testing equipment, talking and monitoring arrangement for the v-f channel, and automatic transfer from a-c power supply to a storage battery in case of a-c power supply failure.

Repeater CF-3-(*) is contained in a wooden case, equipped with two carrying handles on each side. The front and rear covers are removable. The power cords and battery cord extend from the bottom of the bay. A handset is provided for use in the monitoring circuit. Units requiring adjustments, such as dials and keys, are mounted on the front of the panels. The binding post panel is located at the top of the bay.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normal output is 0 dbm; may be raised to +5 or +10 dbm.

LOCATION IN SYSTEM: At intermediate points in spiral-four system.

RANGE: Spaced at 25-mi intervals.

POWER REQUIRED: 115 to 230 v, 50 to 60 cyc ac; 12-v storage battery.

NORMAL A-C POWER CONSUMPTION: 31 w.

STAND-BY POWER, CONSUMPTION-CAPACITY: 2 ea Battery BB-55, 3.75 amp, 40 hr.

TUBE COMPLEMENT: 2 ea 6SJ7, 2 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at cable binding post.

RUNNING SPARES: Tubes, protectors, fuses, and vibrator.

MONITORING: Built-in circuit, channel 1 only.

LEVEL INDICATION: Dbm meter.¹

HOUSING: Rack and panels mounted in wooden case.

LINE TERMINATIONS: 4-wire only, 600-ohm impedance.

SIGNAL AND ALARM CIRCUIT: Uses one of the simplex circuits.

TOOLS AND TEST SETS REQUIRED: TE-123 and IE-53; part of TC-23-(*).

¹ Test tone is applied at either end of the system by CF-1-(*). The dbm meter at the repeater measures the level at the output of ea amplifier.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	225	340
Total volume (cu ft).....	9	17.9
Ship tons.....		.5

Status: Standard. Stock No.: 4B4484. Reference: TM 11-2008.

Converter CF-4 is a group-modulator designed for adapting the 4-wire transmission of CF-1-(*) equipment to a 2-wire line. The CF-4 is mounted in a portable wooden carrying case with removable front and rear covers. The control, adjustment, and terminating equipment is mounted on the front panel where it is easily accessible. The a-c power cord and the battery cord are extended from the lower front panel of the bay.

Converter CF-4 is used to provide equivalent 4-wire operation over one pair of open wire. The B-A direction of transmission remains in the .2- to 11.6-kc frequency band, but the A-B direction of transmission is raised to the 20.85- to 32.25-kc band. The CF-4 contains amplifiers, equalizers, oscillators, modulator, demodulator, directional filters, and composite equipment.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: A-B output +18 to -17 dbm (+13 normal); B-A output +15 to -20 dbm (+10 normal).

LOCATION IN SYSTEM: At junction of 2-wire open wire and 4-wire facility.¹

RANGE: Dependent on characteristics of open wire facility used.

POWER REQUIREMENTS: 115 to 230 v, 50 to 60 cyc ac; 12-v storage battery.

NORMAL A-C POWER CONSUMPTION: 31 w.

STAND-BY POWER, CONSUMPTION-CAPACITY: 2 ea Battery BB-55, 3.5 amp, 43 hr.

TUBE COMPLEMENT: 3 ea 6SJ7, 3 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at line and cable binding posts.

RUNNING SPARES: Tubes, protectors, fuses, and vibrator.

LEVEL INDICATOR: Dbm meter.

HOUSING: Rack and panels mounted in wooden case.

CARRIER FREQUENCIES: 20,650 (upper side band transmitted).

LINE TERMINATIONS: 4-wire local side; 2-wire open wire line side.

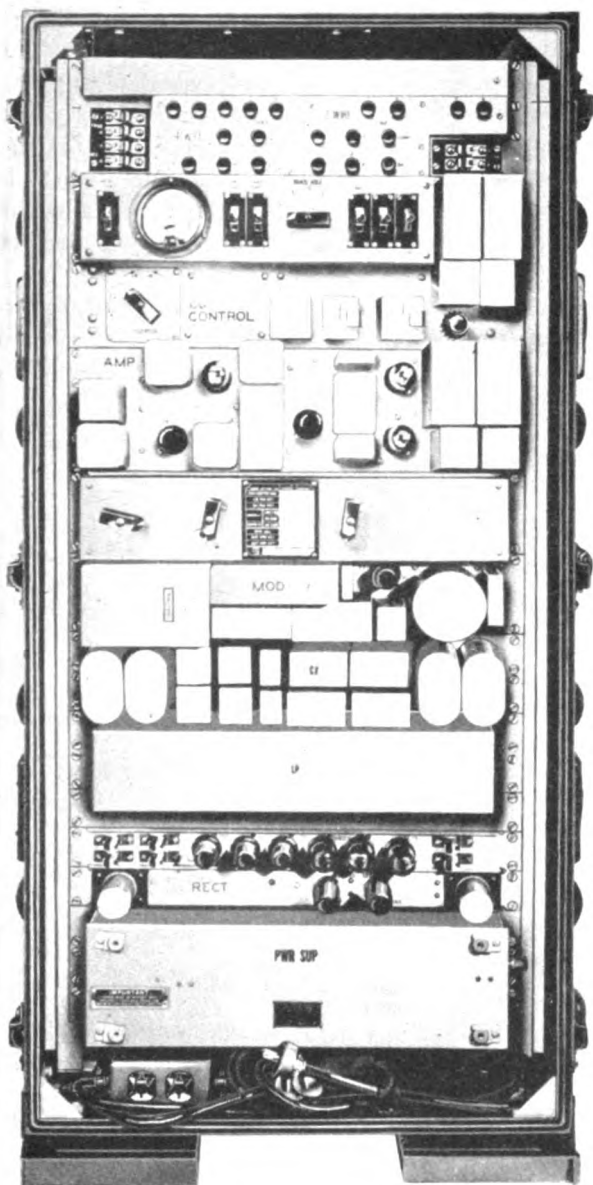
SIGNAL AND ALARM CIRCUIT: Uses one of the composite circuits.

TOOL AND TEST SETS REQUIRED: TE-123 and IE-53; part of TC-21-(*).

¹ Will normally be operated adjacent to Telephone Terminal CF-1-(*) or Repeater CF-3-(*), but can be separated from them by as much as 1 mi of spiral-four cable.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	280	530
Total volume (cu ft).....	12	35
Ship tons.....		.9



CF-4

Figure 49. Converter CF-4.

Status: Standard. Stock No.: 4B3205. Reference: TM 11-2008.

Repeater CF-5 is an open wire carrier repeater designed for extending the range of an open wire facility on which Converter CF-4 is used. The CF-5 is mounted in a portable wooden carrying case with removable front and rear covers. The control, adjustment, monitoring, and terminating equipment is mounted on the front panel where it is easily accessible. The a-c power cord and the battery cord are extended from the lower part of the repeater bay.

Repeater CF-5 is used to amplify all transmission present on the physical pair of an open wire carrier line when used at intermediate points on a line using Converter CF-4. The CF-5 contains amplifiers, equalizers, directional filters, and composite equipment.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: A-B output normally +13 dbm;
B-A output normally +10 dbm.

LOCATION IN SYSTEM: At intermediate points, CF-4 system.

RANGE: Dependent on characteristics of open wire facility used.

POWER REQUIRED: 115 to 230 v, 50 to 60 cyc ac;
12-v storage battery.

NORMAL A-C POWER CONSUMPTION: 46 w.

STAND-BY POWER, CONSUMPTION-CAPACITY:
2 ea Battery BB-55, 4.5 amp, 33 hr.

TUBE COMPLEMENT: 3 ea 6SJ7, 3 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at line binding posts.

RUNNING SPARES: Tubes, protectors, fuses, and vibrator.

MONITORING: Built-in circuit, channel 1 only.

LEVEL INDICATION: Dbm meter.

HOUSING: Rack and panels mounted in wooden case.

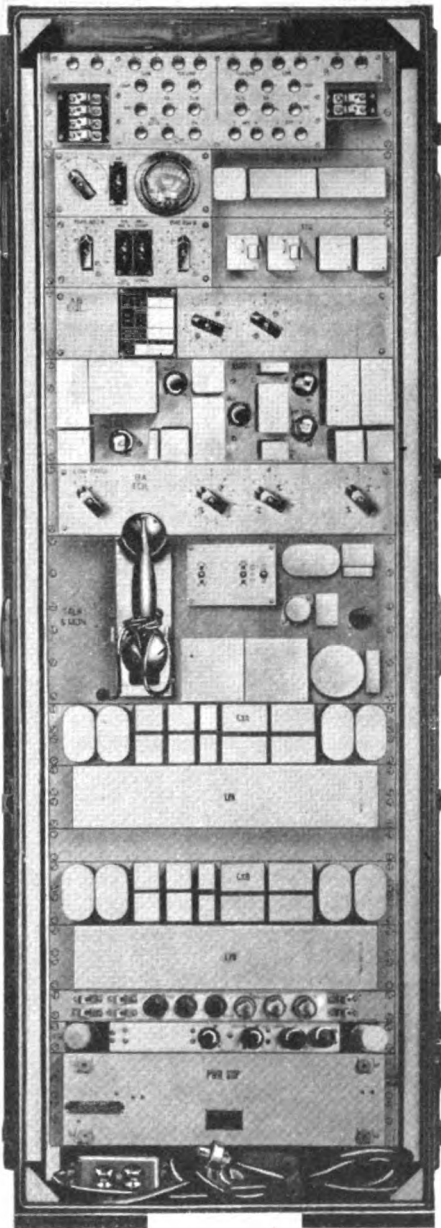
LINE TERMINATIONS: 2-wire only, 600-ohm impedance.

SIGNAL AND ALARM CIRCUIT: Uses one of the composite circuits.

TOOL AND TEST SETS REQUIRED: TE-123 and IE-53; part of TC-37.

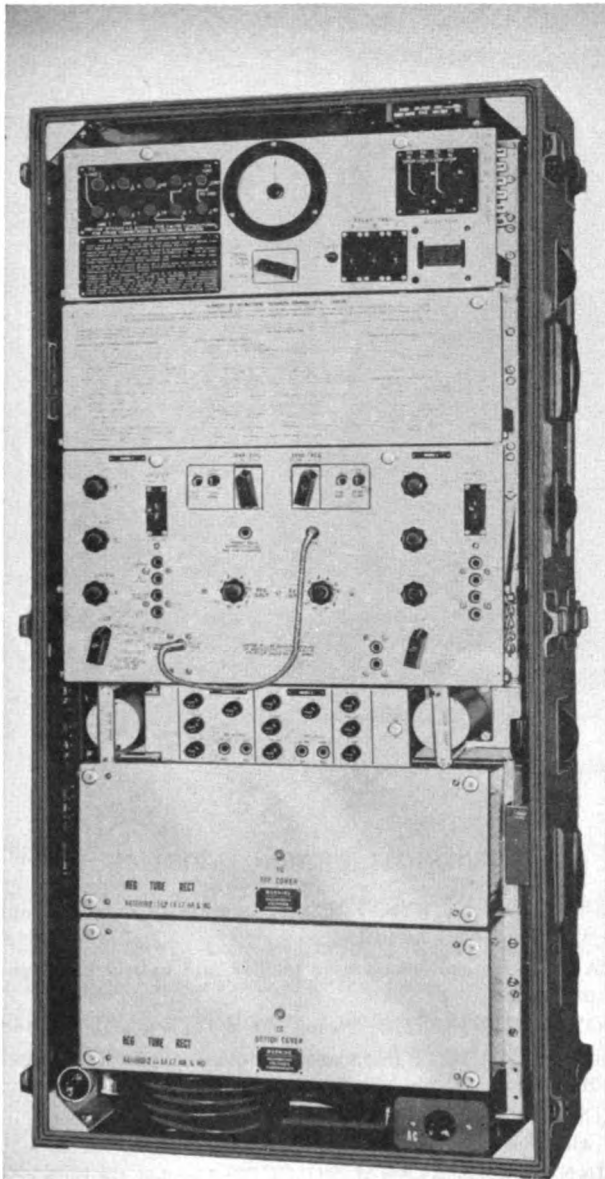
WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	380	690
Total volume (cu ft).....	17.7	40
Ship tons.....		1.0



CF-5

Figure 50. Repeater CF-5.



CF-6

Figure 51. Telegraph Terminal CF-6 (carrier).

Status: Standard. Stock No.: 4A2892-6. Reference: TM 11-2009.

Telegraph Terminal CF-6 is a single bay which holds the equipment for two v-f telegraph chan-

nels. This equipment is mounted in a wooden case with removable front and rear covers. It is a 2-channel carrier telegraph terminal designed primarily to be used with, and to supplement, Telegraph Terminal CF-2-(*).

The CF-6 provides 2 two-way telegraph channels by using unused frequencies at the bottom, the middle, and the top of the frequency band normally used by Telegraph Terminal CF-2-(*).

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normally -10 dbm, may be raised to 0 dbm for special cases.

LOCATION IN SYSTEM: At termination of telephone channel.¹

RANGE: Dependent on wire facility; is operable over 25-db net loss facility.

POWER REQUIRED: 115 to 230 v, 50 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 149 w max.

TUBE COMPLEMENT: 10 ea 6SJ7, 4 ea 394A.

LIGHTNING PROTECTION: Carbon blocks at all line and loop binding posts.

RUNNING SPARES: Tube, protectors, fuses, vibrator, and relays.

MONITORING: Monitor printer jacks on both channels.

LEVEL INDICATION: All measurements covered.²

HOUSING: Rack and panels mounted in wooden case.

CARRIER FREQUENCIES: Channel 5—425 and 2,125 cps. Channel 6—1,275 and 2,295 cps.

LINE TERMINATION: 2-wire or 4-wire telephone line.

DROP AND LOOP TERMINATIONS: 2-wire and ground return.³

TOOL AND TEST SET REQUIRED: Relay adjusting tools; part of CF-6.

¹ Normally used as a supplement to CF-2 (*) to provide channels 5 and 6, where needed, but may be used independently.

² Send and receive loop current, send bias, received current, relay test, power supply voltages, and audio output level.

³ The following loop circuits may be accommodated: full- and half-duplex to either positive or negative battery, half-duplex polar and full-duplex two-path polar.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	400	520
Total volume (cu ft).....	12	27
Ship tons.....	-----	.7



Figure 52. Carrier Hybrid CF-7.

Status: Standard. *Stock No.:* 4B1467. *Reference:* TM 11-2003.

Carrier Hybrid CF-7 is a repeating coil hybrid designed for adapting the 4-wire transmission of CF-1-(*) equipment to 2-wire, open wire lines of limited length. The CF-7 is a small portable apparatus contained in a weatherproofed wooden case.

Carrier Hybrid CF-7 is designed primarily for use on the shorter length open wire carrier systems which do not necessitate the use of the more elaborate CF-4 and CF-5 equipments. The CF-7 includes a hybrid coil, adjustable balancing network, variable building-out capacitor, d-c telegraph composite set with noise filter, and low-pass filter. In an emergency, the CF-7 may be used on Wire W-143 for short distances.

TECHNICAL CHARACTERISTICS

LOCATION IN SYSTEM: At junction of 2-wire open wire and 4-wire facilities.

RANGE: Dependent on wire facility and hybrid balances obtainable.

POWER REQUIRED: None.

LINE PROTECTION: Carbon blocks at line and cable binding posts.

LINE TERMINATION: 4-wire cable side, 2-wire open wire line side.

SIGNAL AND ALARM CIRCUIT: Carried through on one of the composite circuits.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	48	75
Total volume (cu ft).....	.8	2.2
Ship tons.....		.1

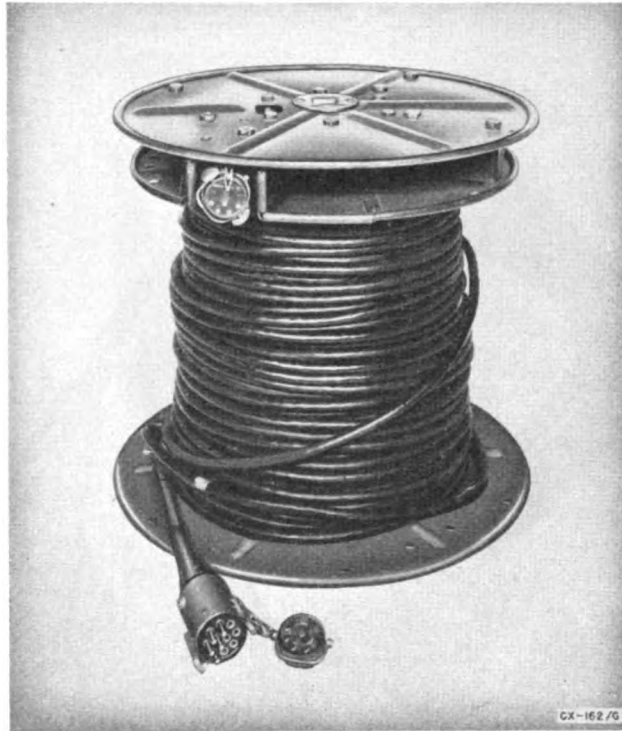


Figure 53. Cable Assembly CX-162/G.

Status: Standard. *Stock No.:* 3E6000-162.
Reference: TM 11-371.

Cable Assembly CX-162/G is a 5-pair, color-coded, rubber-insulated, rubber-jacketed cable which is equipped with a connector on each end. The cable conductors are connected identically to the plugs and sockets of each connector, the rubber compound of which is vulcanized securely to the cable jacket.

Cable Assembly CX-162/G is used as an entrance cable in congested areas around Division (or higher) Headquarters or construction centers. It may be used as a distribution cable at semipermanent installations or for short trunks between switchboards in the same general area.

TECHNICAL CHARACTERISTICS

a. PHYSICAL DATA:

- Size of conductors: #19 AWG annealed copper.
- Number of conductors: 10.
- Outside diameter of cable: .5 in.
- Min. tensile strength: 425 lb.
- Breaking strength at connectors: 425 lb.
- Conductor resistance, max. per loop mi. at 68° F: 92.0 ohms.

b. TRANSMISSION DATA:

- Attenuation per mi at 1,000 cyc:
 - Nonloaded: 1.6 db.
 - Loaded:
 - 5,280-44: .9 db.
 - 5,280-88: .76 db.

WEIGHT AND VOLUME

Weight and volume will depend on lengths requisitioned.

	<i>Unpacked</i>	<i>Export pack</i>
Length (ft) -----	100	100
Total weight (lb) -----	15	17

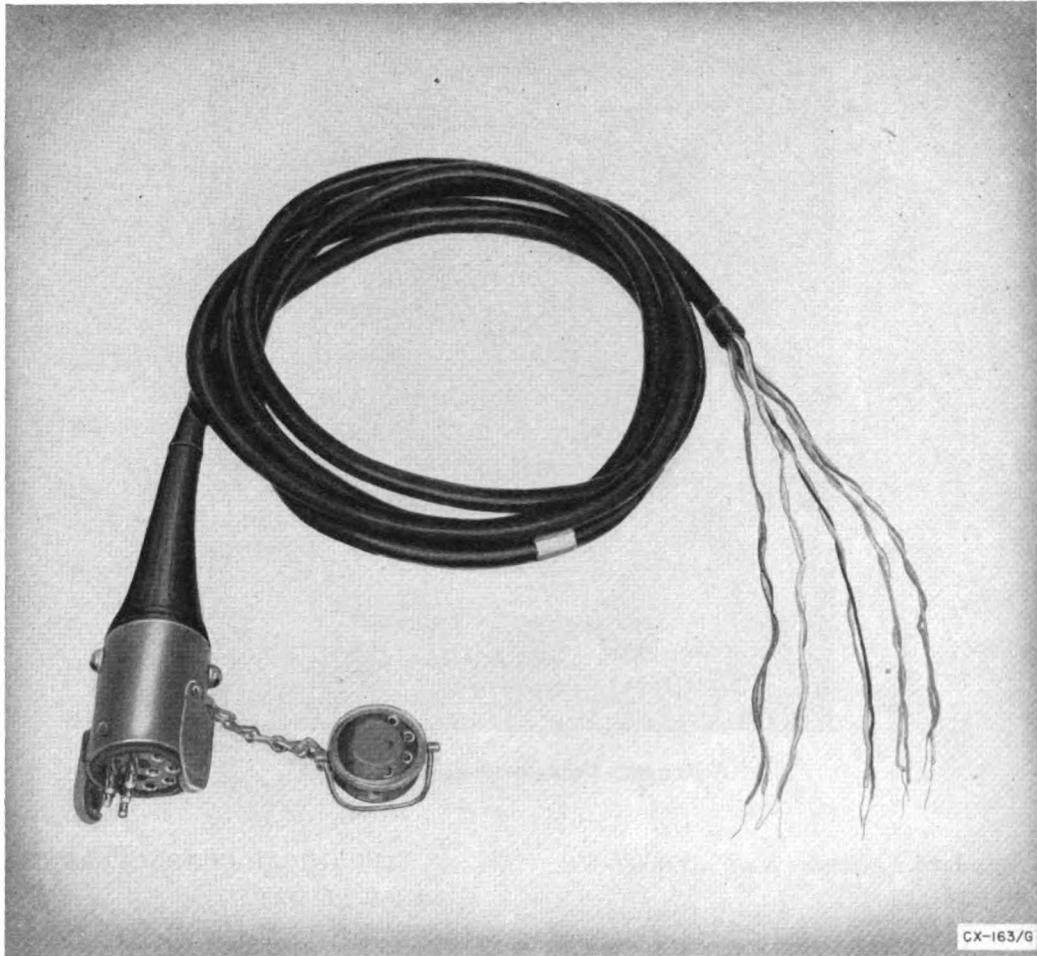


Figure 54. Cable Stub CX-163/G.

Status: Standard. *Stock No.:* 3E6000-163.
Reference: TM 11-371.

Cable Stub CX-163/G is a 12-foot length of 5-pair, color-coded, rubber-insulated, rubber-jacketed cable which is terminated at one end in a connector plug. The free end may be fanned out and connected to suitable terminals. The required length of Cable Stub CX-163/G must be specified when requisitioning.

Cable Stub CX-163/G furnishes a means of terminating Cable Assembly CX-162/G so that it can be connected to terminals or equipment with-

out having to cut and strip the rubber jacket at the end of the cable assembly.

TECHNICAL CHARACTERISTICS

PHYSICAL DATA:

- Size of conductors: #19 AWG annealed copper.
- Number of conductors: 10.
- Outside diameter of cable: .5 in.
- Min. tensile strength: 425 lb.
- Breaking strength at connectors: 425 lb.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Weight of a 12-ft cable stub (lb)---	1.8	2.1

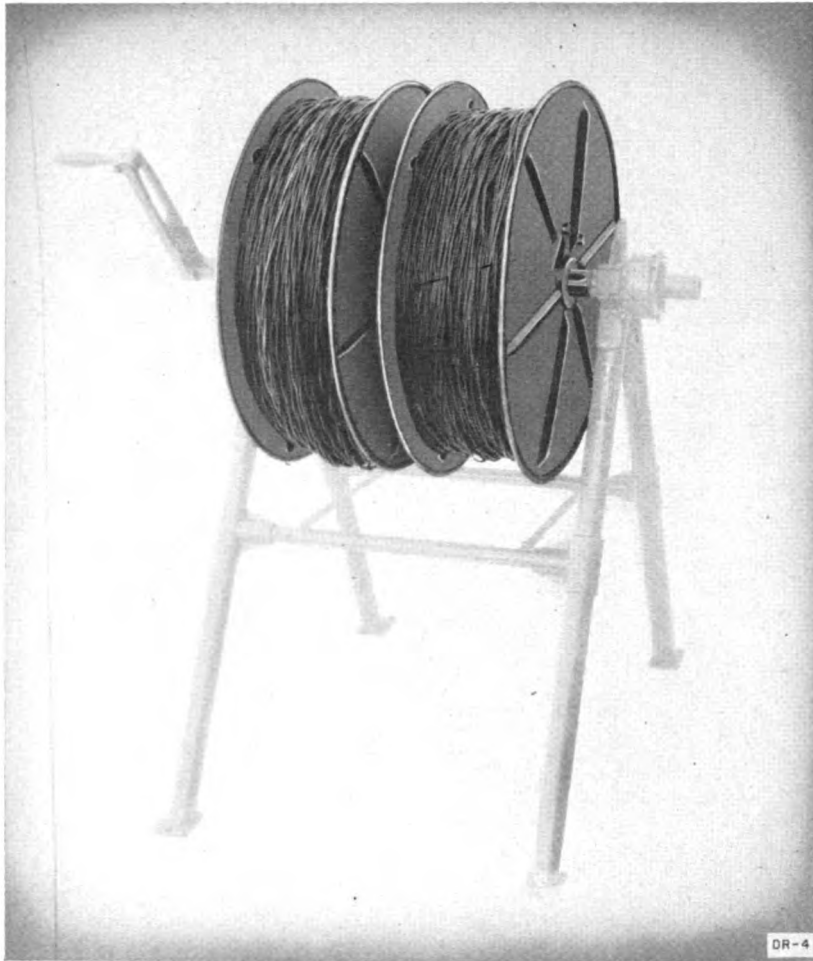


Figure 55. Reel DR-4.

Status: Standard. *Stock No.:* 6H2504.

Reel DR-4 is a steel, spool-type container used to hold field wire or assault wire. It may contain a ½-mile length of Wire W-110-B or 1-mile lengths of Wire WD-1/TT or Wire WD-14/TT. The DR-4 is finished in olive drab paint, and it is 22 inches in diameter and 7 inches wide. It can be mounted on Axle RL-27-A, Reel Unit RL-31, and Reel Cart RL-35.

Reel DR-4 is normally used for transporting and laying field wire.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	22	30
Total volume (cu ft).....	1.9	2
Ship tons.....		.05

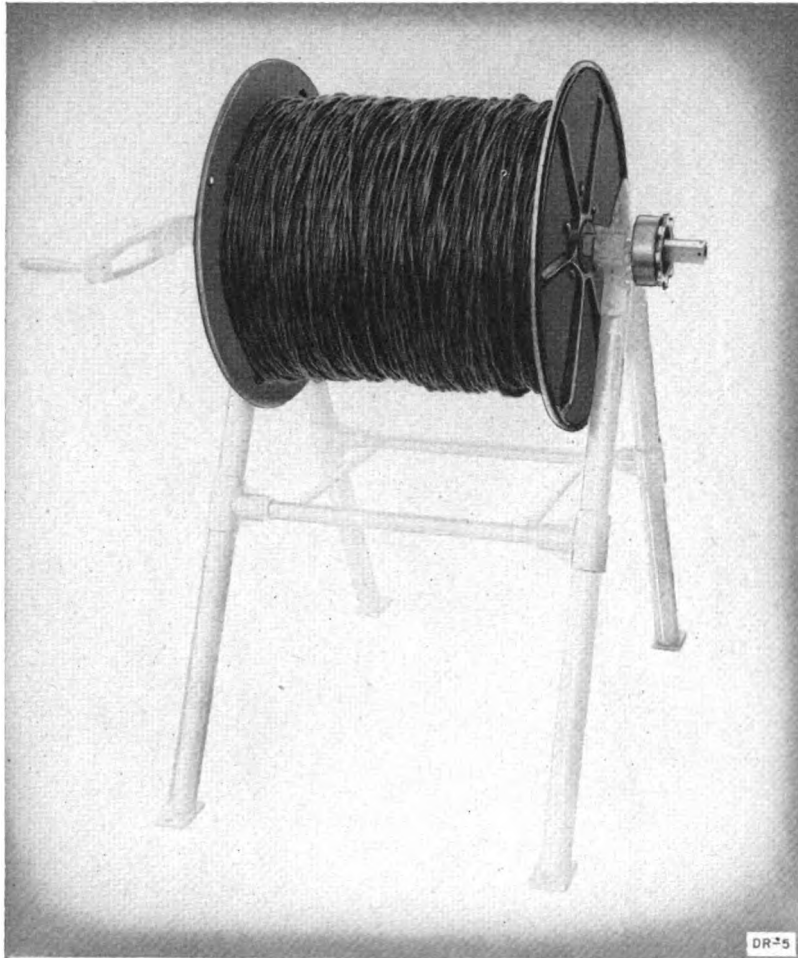


Figure 56. Reel DR-5.

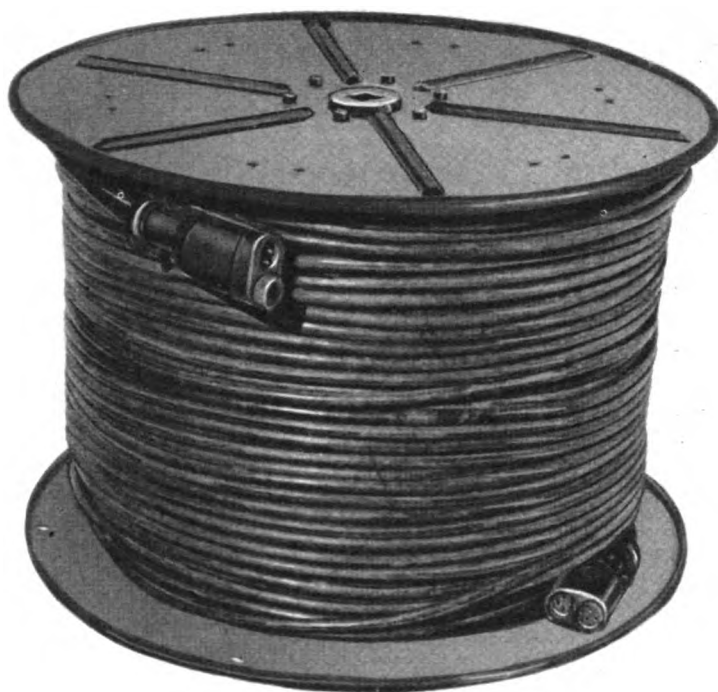
Status: Standard. *Stock No.:* 6H2505.

Reel DR-5 is a steel, spool-type container used to hold field wire W-110-B or long range tactical wire. The DR-5 is finished in olive drab paint, and it is 19½ inches in diameter and 18 inches wide. It has a capacity of 1 mile of Wire W-110-B or ¾ mile of Wire W-143. The DR-5 can be mounted on Reel Unit RL-26, Reel Unit RL-31, and Reel Cart RL-35.

Reel DR-5 normally is used for transporting, storing, or laying field Wire W-110-B or W-143.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	34	40
Total volume (cu ft)-----	3.3	4
Ship tons-----		.1



DR-7

Figure 57. Reel DR-7.

Status: Standard. *Stock No.:* 6H2507.

Reel DR-7 is a steel, spool-type container used to hold Signal Corps Cable Assembly CC-345 or CC-355-A. The DR-7 is finished in olive drab paint, and it is 27½ inches in diameter and 18 inches wide. It has a capacity of ½ mile of Cable Assembly CC-345 or 1,000 feet of Cable Assembly CC-355-A. The DR-7 can be mounted on Reel Unit RL-31.

Reel DR-7 normally is used for transporting, storing, or laying Cable Assembly CC-345 or CC-355-A.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	40	47
Total volume (cu ft).....	6	8
Ship tons.....		.2

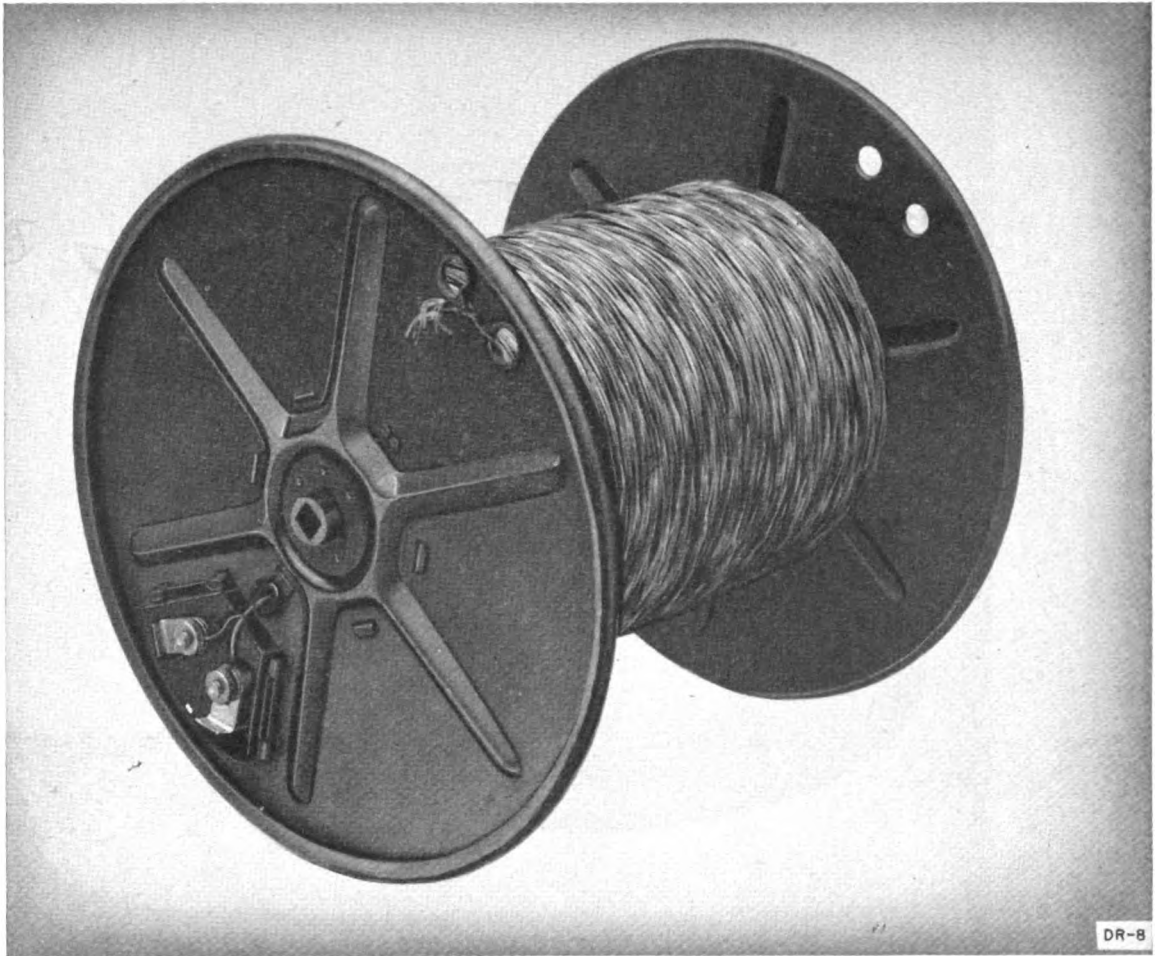


Figure 58. Spool DR-8-A.

Status: Standard. *Stock No.:* 6H7108A. *Reference:* TM 11-2250.

Spool DR-8-A is a steel, spool-type container used to hold assault wire. The DR-8 is finished in olive drab paint, and it is 9 inches in diameter and 8 inches wide. Spool DR-8-A is the same as Spool DR-8 except that it is provided with additional holes for connecting inner end of wire to reel flange. It is a separate item and also a

component of Reel RL-39. The DR-8-A is used as part of Reel Equipment CE-11 for laying or recovering $\frac{1}{4}$ mile of Wire WD-1/TT or WD-14/T.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	2	3.1
Total volume (cu ft).....	.37	.4
Ship tons.....		.01

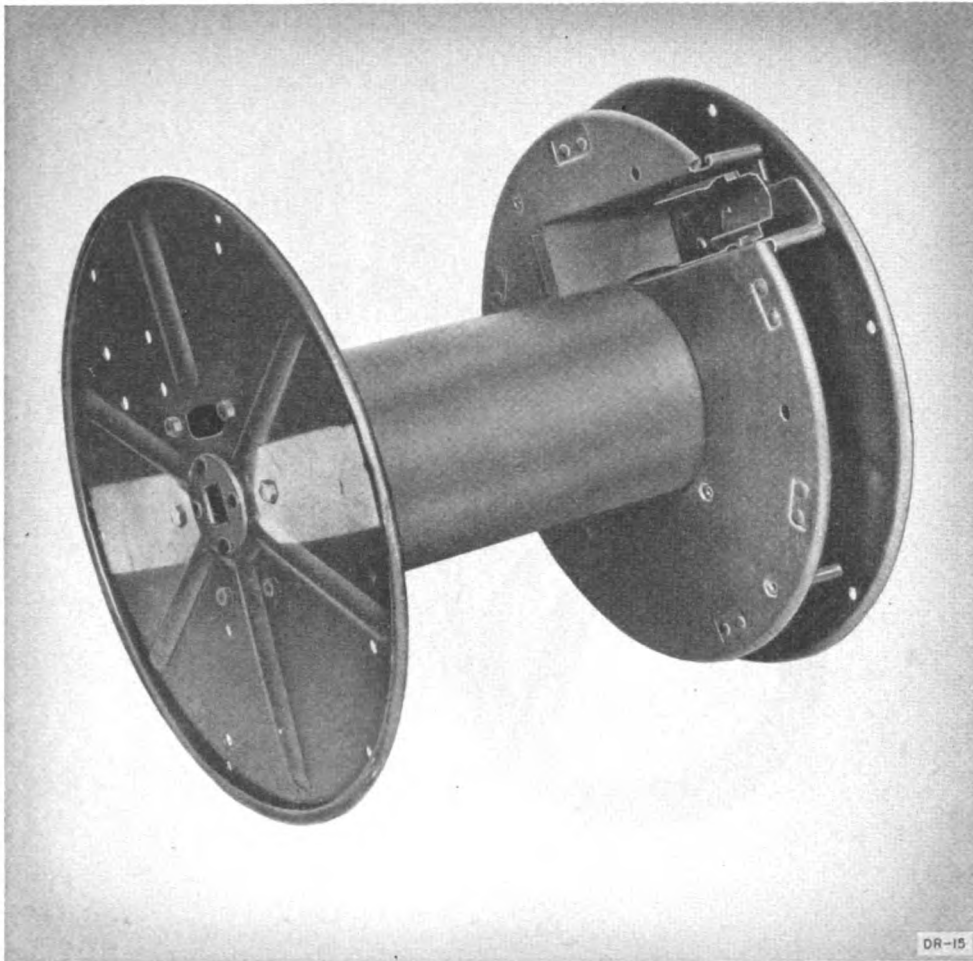


Figure 59. Reel DR-15.

Status: Standard. *Stock No.:* 6H2515. *Reference:* TM 11-369.

Reel DR-15 is a steel, spool-type container equipped with an Adapter FT-315. The DR-15 is used to hold rubber-jacketed field cable, and Adapter FT-315 is used to hold the connector-equipped ends of the cable. Reel DR-15 is finished in olive drab paint, and it is 19½ inches in diameter and 18 inches wide. It has a capacity of ¼ mile of Cable Assembly CC-358 or 1,000 feet of

Cable Assembly CC-345. The DR-15 can be mounted on Reel Unit RL-26, Reel Unit RL-31, or Reel Cart RL-35.

Reel DR-15 is used for transporting, storing, or laying of spiral-four cable.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	40	46
Total volume (cu ft).....	3.3	4.8
Ship tons.....	.....	.12

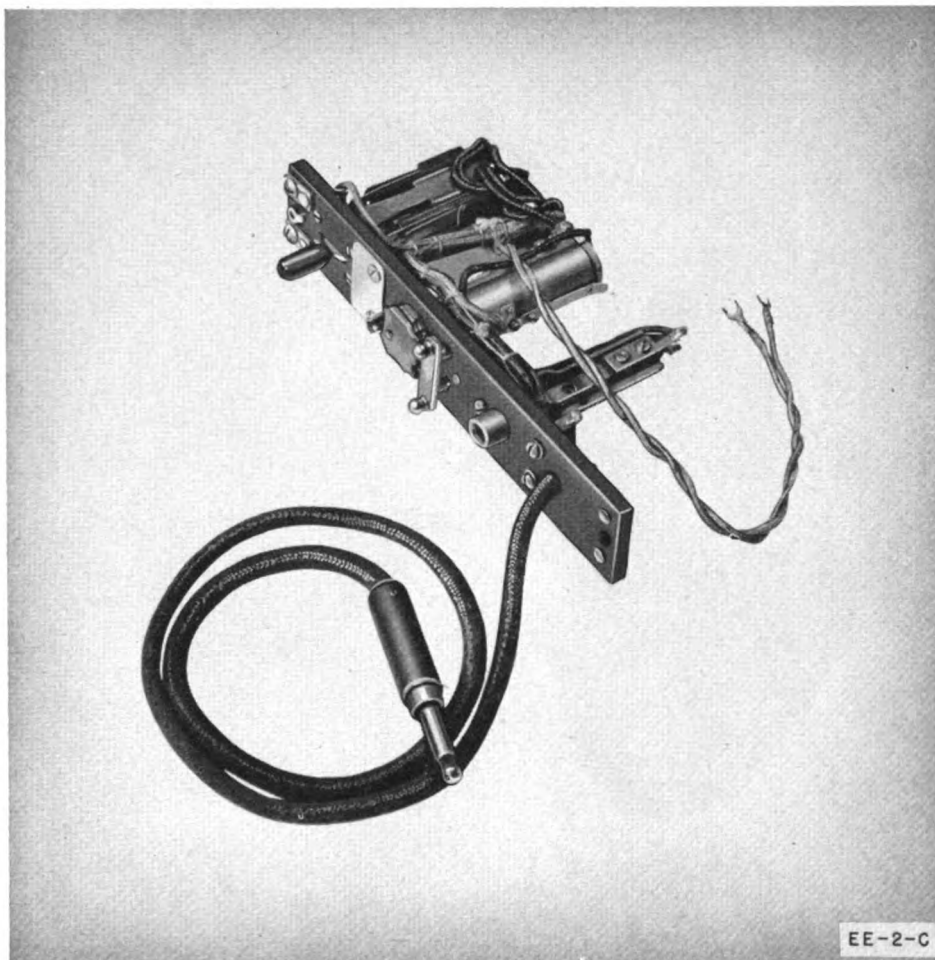


Figure 60. Switchboard Unit EE-2-C.

Status: Limited/Std. *Stock No.:* 4C9912B (EE-2-B) and 4C9912C (EE-2-C). *Reference:* TM 11-330.

Switchboard Unit EE-2-(*) represents EE-2-B and EE-2-C. Switchboard Unit EE-2-(*) contains all the equipment necessary for the central office end of one local battery telephone circuit. Two terminals at the top of the unit provide for connection to the telephone line. Mounted directly below the line terminals is the line drop signal, and below the signal is the line jack. The cord, which is equipped with Plug PI-11, extends from the lower part of the unit.

TECHNICAL CHARACTERISTICS

	EE-2-B	EE-2-C
D-C RESISTANCE (approx)	200 ohms...	500 ohms.
MINIMUM OPERATING CURRENT.....	.002 mp....	.001 amp.
IMPEDANCE AT 1,000 CYCLES.....	3,000 ohms.	6,500 ohms.
LIGHTNING PROTECTION.....	Air spark gap	Same.

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
1.2	7 $\frac{13}{16}$	1 $\frac{3}{8}$	4 $\frac{1}{8}$



Figure 61. Telephone EE-8-B.

Status: Standard. *Stock No.:* 4B5008. *Reference:* TM 11-333.

Telephone EE-8-(*) represents EE-8, EE-8-A, and EE-8-B. Telephone EE-8-(*) is a portable field telephone designed for tactical use on either local or common battery telephone systems. The EE-8-(*) is compact, rugged, and portable. It contains all the elements necessary for a local battery telephone with facilities for common battery, switch hook signaling. The circuit elements are arranged for antisidetone operation.

The case containing Telephone EE-8-(*) is made of leather or canvas and has an adjustable carrying strap. The cover is hinged at the back, overlaps the sides and front, and fastens in front with a snap fastener. The space within the case which is not occupied by the body of the telephone is used for storing the handset. Telephone EE-8-(*) is designed for use at corps level and below. It may be used at any location where a telephone of the EE-8-(*) type is required.

TECHNICAL CHARACTERISTICS

RANGE:

Talking: 30-db net loss circuit.

Ringing: Without repeat coils: Line resistance—3,000 ohms; leakage resistance—1,000 ohms. With repeat coils: Line resistance—2,000 ohms; leakage resistance—1,000 ohms.

POWER SUPPLY REQUIRED: 3 v dc (2 ea Battery BA-30).

LINE TERMINATION: Press-to-talk switch:

<i>Operated</i>	<i>Nonoperated</i>
650/35°	900/62°

LINE PROTECTION: None.

TRANSMISSION AND RECEIVING EQUIPMENT: Handset TS-9-(*).

HOUSING:

	<i>EE-8</i>	<i>EE-8-A</i>	<i>EE-8-B</i>
Case-----	Leather---	Canvas----	Leather or canvas.
Chassis----	Aluminum alloy.	Aluminum alloy.	Sheet steel.

SIGNALING EQUIPMENT: Ringer MC-131; requires 20 cyc ac ringing current; generator output; 20 cyc ac at 90 v.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	9.75	21.5
Total volume (cu ft)-----	.14	.8



Figure 62. Time Interval Apparatus EE-85.

Status: Standard. *Stock No.:* 4H3085. *Reference:* TM 11-433.

Time Interval Apparatus EE-85 is a device designed for making and breaking electrical contacts at predetermined intervals; it thereby produces audible signals from a horn or impresses tone on a telephone line at a regular and predetermined program of time intervals.

Time Interval Apparatus EE-85 is contained in a portable wooden case with hinged cover and a web carrying strap. The EE-85 is intended for use in mobile Coast Artillery installations to time accurately and in proper sequence all functions of fire control. The equipment is completely portable and can be installed in a few minutes. Con-

nections between the EE-85 and other apparatus are made with field wire.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 14 lines.

LOCATION IN SYSTEM: At fire-control center of mobile artillery gun battery.

POWER REQUIRED: 12 v d-c, such as 2 ea Battery BB-55.

SIGNAL TIME INTERVALS: 1, 5, 10, 15, 20, 30, and 45 seconds or combinations thereof.

USED WITH: Line Connector EE-87 Time Interval Signal BE-65.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	14	21.0
Total volume (cu ft).....	.64	2.5
Ship tons.....		.06

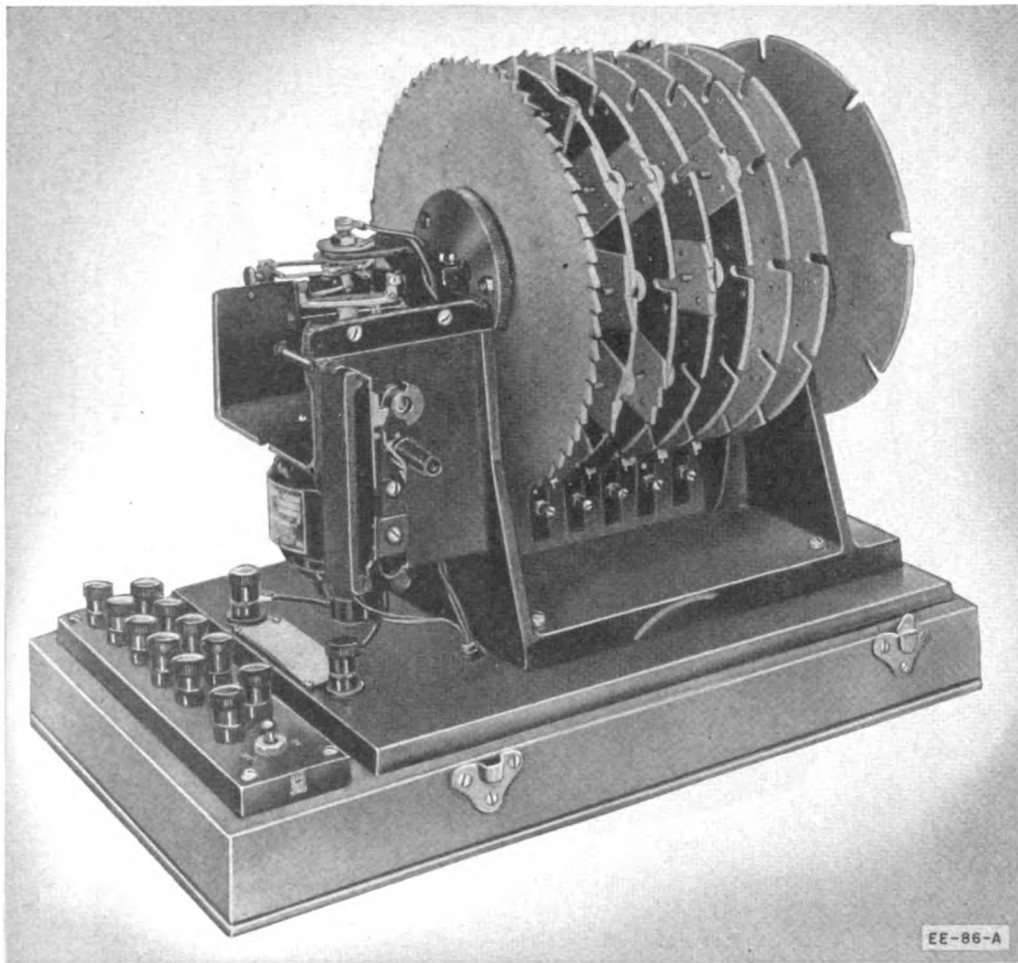


Figure 63. Time Interval Apparatus EE-86-A.

Status: Standard. *Stock No.:* 4H3086A. *Reference:* TM 11-445.

Time Interval Apparatus EE-86-A is a motor-driven timing mechanism contained in a wooden case. It is designed for making and breaking electrical contacts at predetermined intervals; it thereby produces audible signals from a bell or impresses tone on a telephone line at regular and predetermined program of time intervals. By setting up the time interval apparatus to secure the time intervals required and then making the appropriate connections to the signal producing equipment, the desired time interval program will be obtained.

Time Interval Apparatus EE-86-A is used in fixed-plant fire-control systems of Coast Artillery

installations to provide a program of time interval signals for any or all armament activities in the fire-control net.

TECHNICAL CHARACTERISTICS

NUMBER OF TIME INTERVALS: 8 ea at 1, 5, 10, 15, 20, 30, 40, and 60 seconds.

LOCATION IN SYSTEMS: At fire-control center of fixed artillery installation.

POWER REQUIRED: 30 v dc.

USED WITH: Switchboards BD-74 and BD-78 connected to a series of bells, such as Bell MC-153.

AUXILIARY EQUIPMENT: Tuning fork stroboscope.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	72	137
Total volume (cu ft)	1.12	6
Ship tons.....	.....	.15



Figure 64. Line Connector Unit EE-87.

Status: Standard. *Stock No.:* 4H1187. *Reference:* TM 11-433.

Line Connector Unit EE-87 is contained in a case with a web carrying strap and a hinged cover. The panel is made of bakelite and holds the line terminals, battery terminals, relay terminals, and the keys for hummer selection and volume.

Line Connector Unit EE-87 is used to superimpose a 1,000-cyc signal tone on a telephone line at a regular and predetermined interval controlled by Time Interval Apparatus EE-85. It is used in the fire-control systems of mobile Coast Artillery Defense installations.

TECHNICAL CHARACTERISTICS

- LINE CAPACITY: 6 lines.
- LOCATION IN SYSTEM: At fire-control center of mobile artillery gun battery.
- POWER REQUIRED: 12 v dc, such as 2 ea Battery BB-55.
- SIGNAL TIME INTERVAL: Controlled by Time Interval Apparatus EE-85.
- USED WITH: Time Interval Apparatus EE-85.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	25	32
Total volume (cu ft).....	.64	2.5
Ship tons.....		.06



Figure 65. Telephone Repeater EE-89-A.

Status: Standard. **Stock No.:** 4B3289A (EE-89-A) and 4B3289B (EE-98-B). **Reference:** TM 11-2006.

Telephone Repeater EE-89-(*) represents EE-89-A and EE-89-B. Telephone Repeater EE-89-(*) is designed for tactical use in field wire telephone systems. The EE-89-(*) is used to give improved transmission and to extend the talking range of field wire or other wire facilities. Two-wire transmission is used; that is, the same pair is used for transmission in both directions. The repeater is designed for use as an intermediate repeater, and for best results it should be located in the center of a 10-mile line, the characteristics of which are relatively constant. Normal simplex operation and 20-cycle ringing are possible over lines equipped with Repeater EE-89-(*). Telephone Repeater EE-89-(*) is issued in either a

wooden or leather case. In either case, the internal circuits and its capabilities are the same.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: 0 to +8 dbm.
LOCATION IN SYSTEM: At intermediate point.
RANGE: Dependent on balance between the two adjacent line sections.
POWER REQUIRED: 1½-v filament supply and 90 v for plate and screen; 1 ea Battery BA-40.
BATTERY LIFE: Approx 2 weeks under normal weather conditions.
TUBE COMPLEMENT: 1 ea 3Q5GT for operation and 1 ea, spare.
MONITORING: Monitoring receiver.
LEVEL INDICATION: Check for singing.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	6.5	20
Total volume (cu ft) .....	.05	1.2
Ship tons .....		.04

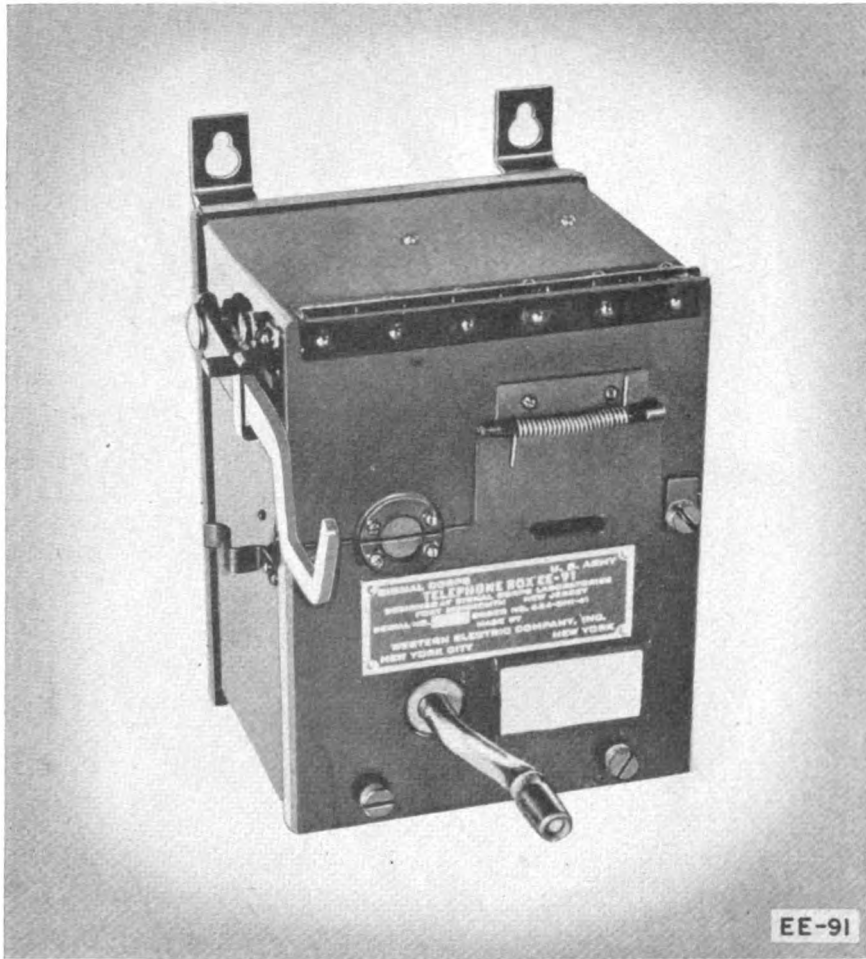


Figure 66. Telephone Box EE-91.

Status: Standard. *Stock No.:* 4B8191.

Telephone Box EE-91 is a wall-mounted telephone designed for common battery operation; it is equipped with a hand generator for signaling on magneto lines. The EE-91 is inclosed in a pressed metal box with a black finish and is intended for outdoor and indoor use. Handset TS-12 or Head and Chest Set HS-17 can be used with but are not part of the EE-91.

Telephone Box EE-91 is used in fixed-plant, fire-control, communication systems of Coast Artillery harbor defense installations.

TECHNICAL CHARACTERISTICS

RANGE:

Talking: 30-db net loss circuit.

Ringing: Line resistance 3,000 ohms; leakage resistance 1,000 ohms.

AUXILIARY EQUIPMENT REQUIRED: Hand set or head and chest set.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	12	18
Total volume (cu ft).....	.4	.7

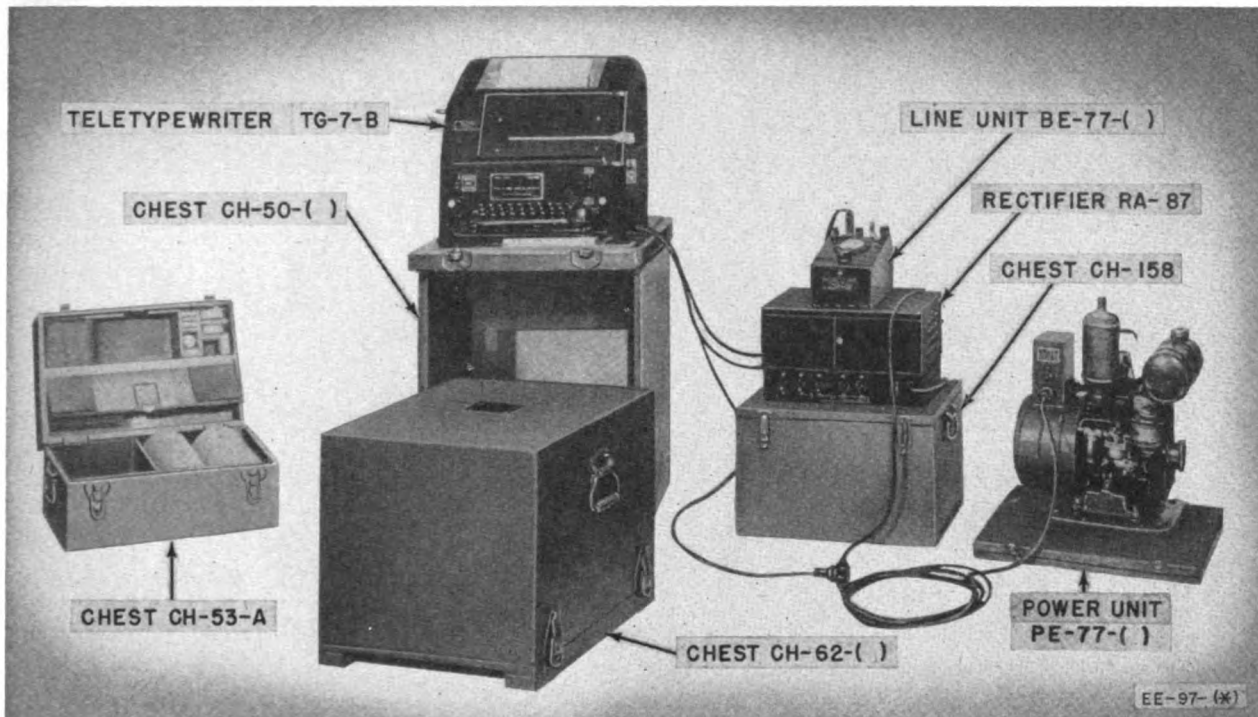


Figure 67. Teletypewriter Set EE-97-A.

Status: Standard. **Stock No.:** 4TEE97A (EE-97 and EE-97-A) and 4TEE97B (EE-97-B).
Reference: TM 11-354.

Telegraph Printer Set EE-97-(*) represents EE-97, EE-97-A, and EE-97-B. Telegraph Printer Set EE-97-(*) is a complete, transportable sending and receiving teletypewriter station developed for tactical use. The teletypewriter station is used as a terminal on land lines or radio circuits to send and receive page-printed teletypewriter messages. The EE-97-(*) can be installed easily and quickly in any location requiring the use of a teletypewriter station, as connections are made by cords without the use of tools.

The EE-97-(*) is complete with a line unit, teletypewriter, rectifier, a gasoline-engine-driven generator, ground rods, running spares, and sufficient teletypewriter supplies for initial service. Power for operating these sets may be obtained from the power unit or from the rectifier and a suitable a-c power supply. All the individual components are housed in wooden cases and chests to facilitate movement in the field. At installations, the chests are used as tables for the equipment and seats for the operators.

PRINCIPAL COMPONENTS

Component	EE-97	Quantity
Printer TG-7-A.....		1
Rectifier RA-37.....		1
Line Unit BE-77 with Bias Meter I-97-A.....		1
Power Unit PE-77-(*).....		1
Ground Rod GP-29.....		2
	<i>EE-97-A</i>	
Teletypewriter TG-7-B.....		1
Rectifier RA-87.....		1
Line Unit BE-77-A.....		1
Power Unit PE-77-(*).....		1
Ground Rod MX-148/G.....		2

TECHNICAL CHARACTERISTICS

LINE OPERATION: 60 ma, neutral type.

POWER SUPPLY:

Stand-by:

Power Unit PE-77-(*): Output: 250 w at 115 v dc.

Rectifier: Input: 115 v, 50 to 60 cyc ac; output .4 amp, max, 115 v dc.

SPEED OF OPERATION: 60 wpm (368 opm); 66 wpm (404 opm).

LINE PROTECTION AND TERMINATION: Line Unit BE-77 makes necessary connections between d-c power source, wire line, and teletypewriter equipment; repeats signals transmitted to and received from line; and provides fuse protection.

WEIGHT AND VOLUME

	Unpacked		Export pack	
	EE-97	EE-97-A	EE-97	EE-97-A
Total weight (lb).....	440	455	685	700
Total volume (cu ft)....	16.0	16.25	38	38
Ship tons.....			1.0	1.0

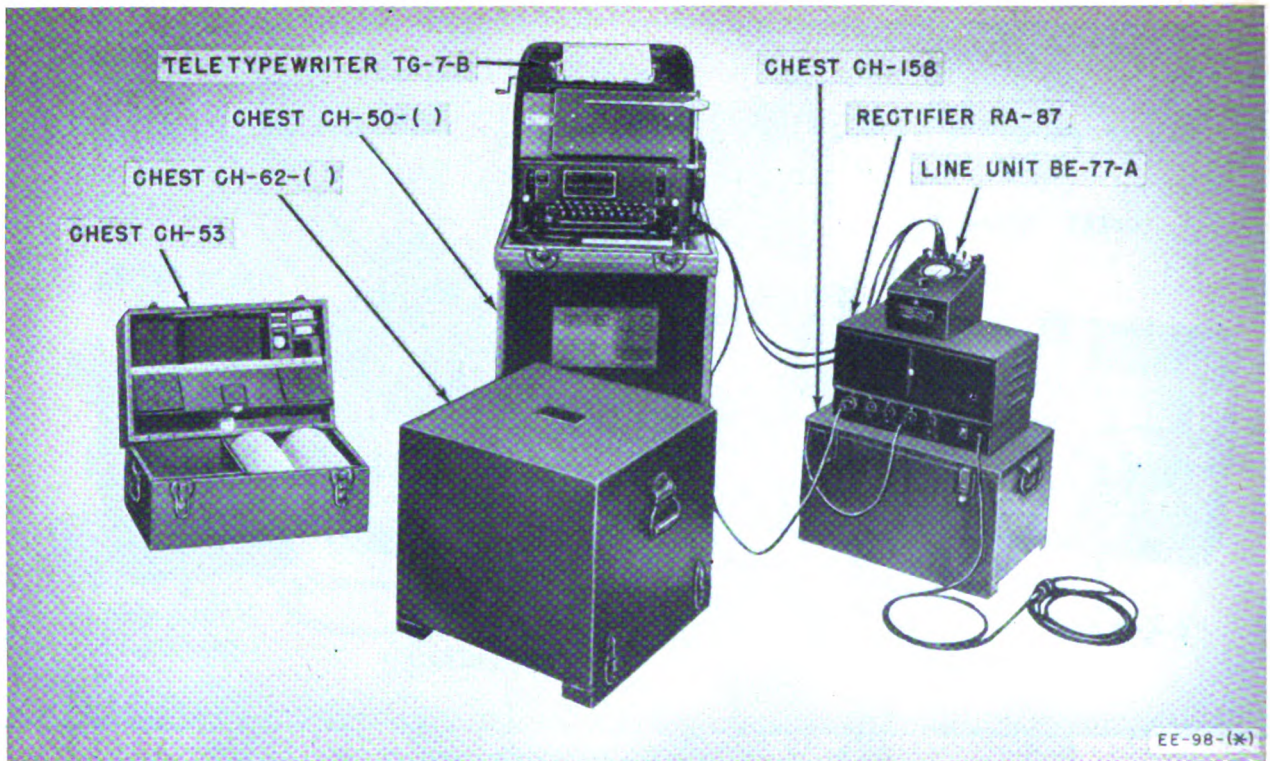


Figure 68. Teletypewriter EE-98-A.

Status: Standard. *Stock No.:* 4TEE98A (EE-98-A) and 4TEE98B (EE-98-B). *Reference:* TM 11-354.

Telegraph Printer EE-98-(*) represents EE-98-A and EE-98-B. It is a transportable sending and receiving teletypewriter station developed for tactical use. The teletypewriter station is used as a terminal on land lines or radio circuits to send and receive page-printed teletypewriter messages. The EE-98-(*) can be easily and quickly installed in any location requiring the use of a teletypewriter station, as connections are made by cords without the use of tools.

The EE-98-(*) is composed of a line unit, teletypewriter, rectifier, ground rods, running spares, and sufficient teletypewriter supplies for initial service. All the individual components are housed in wooden cases and chests to facilitate movement in the field. The chests are used at installations as tables for the equipment and seats for the operators. The EE-98-(*) is intended for use at installations that have a central power plant, therefore a primary source of power is not provided. An external source of ac is required for their operation.

TECHNICAL CHARACTERISTICS

LINE OPERATION: 60 ma, neutral type.

POWER SUPPLY:

Required: 115 or 230 v, 50 to 60 cyc ac.

Rectifier: Output: .4 amp, 115 v dc, 46 w 4.35 amp, 115 v ac, 500 w.

Speed of operation: 60 wpm (368 opm) 66 wpm (404 opm).

Line protection and termination: Line Unit BE-77-A makes necessary connections between d-c power source, line, and teletypewriter equipment; repeats signals transmitted to and received from line; and provides fuse protection.

PRINCIPAL COMPONENTS

Component	Quantity
Teletypewriter TG-7-B.....	1
Rectifier RA-87.....	1
Line Unit BE-77-A.....	1
Ground Rod MX-148/G.....	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	328	562
Total volume (cu ft).....	12. 75	32. 0
Ship tons.....		. 8



Figure 69. Ringing Equipment EE-100-(A).

Status: Limited/Std. *Stock No.:* 4F2100A (EE-100-A) and 4F2100T1(EE-100-T1). *Reference:* TM 11-342.

Ringing Equipment EE-100-(*) represents EE-100-A and EE-100-T1. Ringing Equipment EE-100-(*) is a v-f ringer, housed in a wooden case provided with two carrying handles. It is designed for converting l-f ringing signals (20 cycle) to 1,000/20 cycle for transmission over a telephone circuit using carrier equipment or repeaters. It also receives 1,000/20-cycle signaling current from the transmission line and converts it to 20-cycle ringing current for operation of the switchboard drops.

Ringing Equipment EE-100-(*) provides ringing facility for one telephone channel when such channel involves terminal or repeater equipment which will not normally pass l-f ringing current. The EE-100-(*) is designed primarily for a-c operation, but throw-over to a 12-volt storage battery in emergency is automatic.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: 0 to -3 dbm.
LOCATION IN SYSTEM: At terminal of telephone channel before connection to switchboard.
RANGE: 30-db net loss channel.
POWER SUPPLY REQUIRED: 115/23 v, 50 to 60 cyc ac or 12-v storage battery.
NORMAL A-C POWER CONSUMPTION: 31 w.
STAND-BY POWER, CONSUMPTION-CAPACITY: 2 ea Battery BB-55, 3.2 amp for 45 hr.
TUBE COMPLEMENT: 3 ea 6SJ7, 1 ea 6V6GT.
RUNNING SPARES: Tubes, fuses, and vibrator.
HOUSING: Rack and panel mounted in wooden case.
FREQUENCIES: Line side, 1,000 cyc interrupted 19½ times per second; local side, 20 cyc ac.
LINE TERMINATION: Inserted in 2-wire drop.

WEIGHT AND VOLUME

	Unpacked		Export pack	
	EE-100-A	EE-100-T1	EE-100-A	EE-100-T
Total weight (lb).....	100	110	145	155
Total volume (cu ft)....	2.35	2.35	3.6	3.6
Ship tons.....	-----	-----	.1	.1

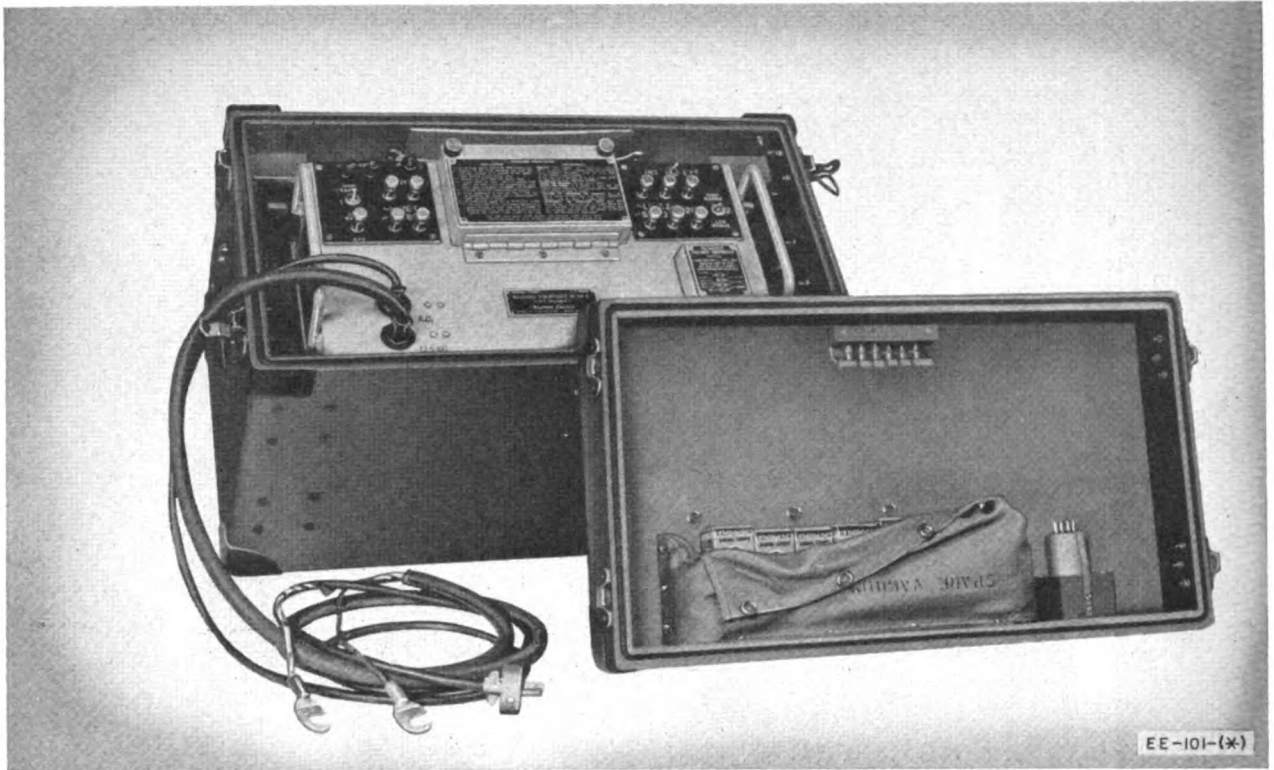


Figure 70. Ringing Equipment EE-101-A.

Status: Standard. Stock No.: 4F2101. Reference: TM 11-342.

Ringing Equipment EE-101-A is a v-f ringer, housed in a wooden case provided with two carrying handles. It is designed for converting l-f ringing signals (20 cycle) to 1,000/20 cycle for transmission over a telephone circuit using carrier equipment or repeaters. It also receives 1,000/20-cycle signaling current from the transmission line and converts it to 20-cycle ringing current for operation of the switchboard drops.

Ringing Equipment EE-101-A provides ringing facilities for two telephone channels when such channels involve terminal or repeater equipment which will not normally pass l-f ringing current. The EE-101-A is designed primarily for a-c operation, but throw-over to a 12-volt storage battery in emergency is automatic.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: 0 to -3 dbm.
 LOCATION IN SYSTEM: At terminal of telephone channel before connection to switchboard.
 RANGE: 30-db net loss channel.
 POWER REQUIRED: 115-230 v, 50 to 60 cyc ac or 12-v storage battery.
 NORMAL A-C POWER CONSUMPTION: 31 w.
 STAND-BY POWER, CONSUMPTION-CAPACITY: 2 ea Battery BB-55, 3.2 amp for 45 hr.
 TUBE COMPLEMENT: 6 ea 6SJ7, 1 ea 6V6.
 RUNNING SPARES: Tubes, fuses, and vibrator.
 HOUSING: Rack and panel mounted in wooden case.
 FREQUENCIES: Line side 1,000 cyc interrupted 19½ times per second; local side, 20 cyc ac.
 LINE TERMINATION: Inserted in 2-wire drop.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	100	140
Total volume (cu ft).....	2.13	3.6
Ship tons.....		.1

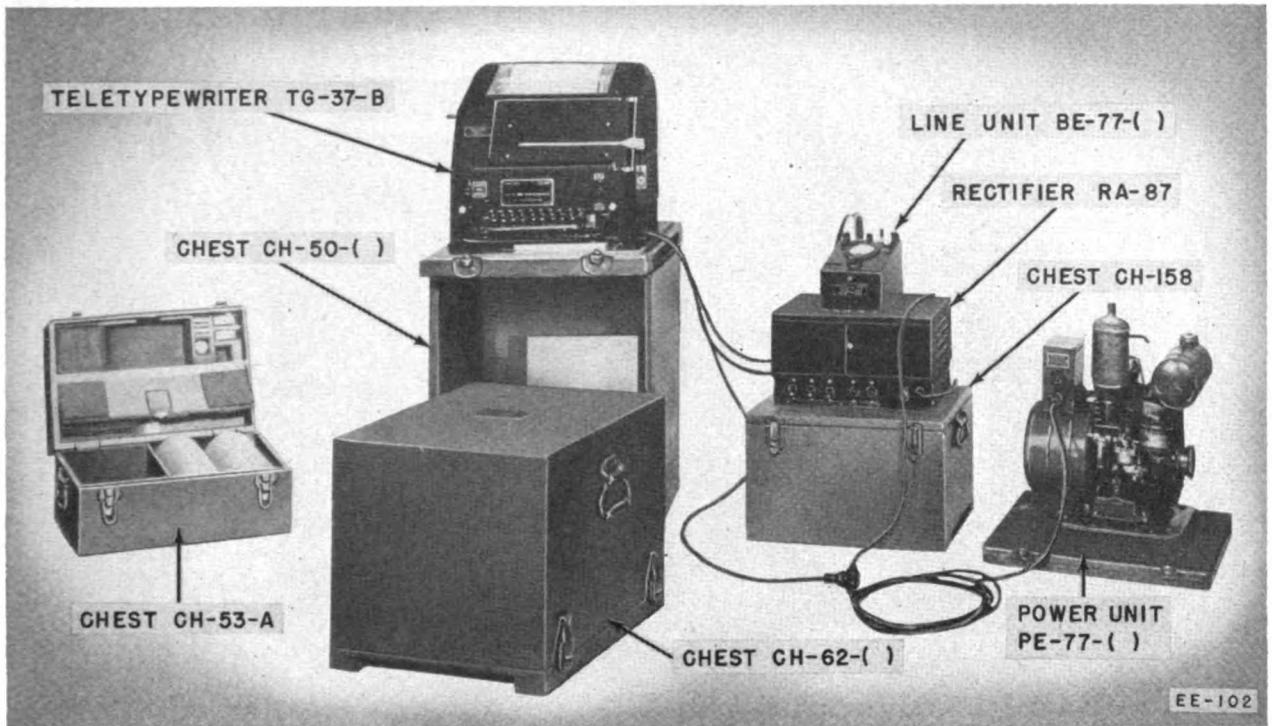


Figure 71. Teletypewriter Set EE-102.

Status: Standard. *Stock No.:* 4TEE102. *Reference:* TM 11-354.

Teletypewriter Set EE-102 is a transportable, sending and receiving teletypewriter station designed for field use in weather information nets of the Air Force and the Ground Forces. The EE-102 has a weather keyboard and type-bar symbols for sending and receiving weather reports. It can be installed easily and quickly in any location as connections are made by cords without the use of tools. All the individual components are housed in wooden cases and chests to facilitate movement in the field. At installations, the chests are used as tables for the equipment and seats for the operators. Most major components of Teletypewriter Set EE-102 are interchangeable with the major components of Teletypewriter Sets EE-97 and EE-98.

TECHNICAL CHARACTERISTICS

LINE OPERATION: 60 ma, neutral type.

POWER SUPPLY:

Required: 115/230 v, 50 to 60 cyc ac.

Rectifier: Output: .4 amp, 115 v dc, 46 w; 4.35 amp, 115 v ac, 500 w.

SPEED OF OPERATION: 60 wpm (368 opm) 66 wpm (404 opm).

LINE PROTECTION AND TERMINATION: Line Unit BE-77-A makes necessary connections between d-c power source, wire line, and teletypewriter equipment; repeats signals transmitted to and received from line; measures and adjusts line current, adjusts quality (bias) of the received signals; measures voltage of the d-c source of power and bias in line signal, and provides fuse protection.

PRINCIPAL COMPONENTS

Component	Quantity
Teletypewriter TG-37-B.....	1
Line Unit BE-77-A.....	1
Ground Rod MX-148/G.....	2
Rectifier RA-87.....	1
Chest CH-50.....	1
Chest CH-62-A.....	1
Chest CH-158.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	328	562
Total volume (cu ft).....	12.25	32
Ship tons.....		.8

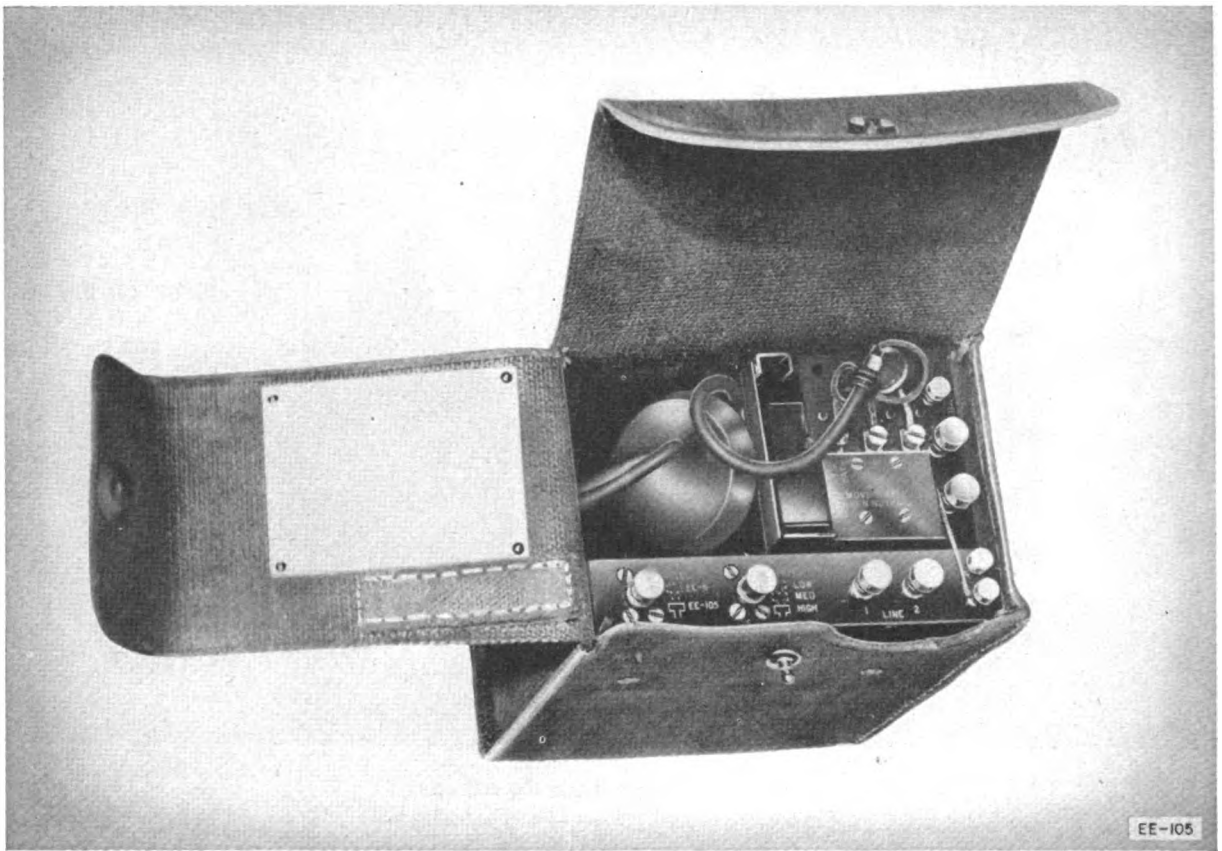


Figure 72. Telephone Unit EE-105.

Status: Standard. *Stock No.:* 4B8405. *Reference:* TM 11-2014.

Telephone Unit EE-105 is a lineman's portable telephone which can be bridged on carrier telephone lines to permit use of the v-f channel without disturbing the carrier channels. It may be used on noncarrier lines and lines equipped with v-f filters.

Telephone Unit EE-105 consists of the handset and chassis of the Telephone Unit EE-8-B plus a v-f filter, impedance control network, two keys, and four binding posts. The components are mounted in a portable case slightly larger than that of an EE-8-B. A 1,000/20-cycle whistle also is included to permit the lineman to signal the terminal. One of the two keys converts the circuit to a normal EE-8-B circuit, without filter; the other key controls impedance. At HIGH position of the impedance key, 4,000 ohms is in series with the line connection; at MEDIUM

1,600 ohms, and at LOW there is no added series resistance with the line connection. Telephone Unit EE-105 is used on transmission lines in CF-1-(*) carrier systems.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Bridge impedance may be changed by means of a three-position key.

LOCATION IN SYSTEM: Portable, anywhere on carrier line.

POWER SUPPLY REQUIRED: Dry battery operation, 3 v dc.

POWER SOURCE: 2 ea Battery BA-30.

NOMINAL IMPEDANCE: Impedance key marked HIGH, MED, and LOW.

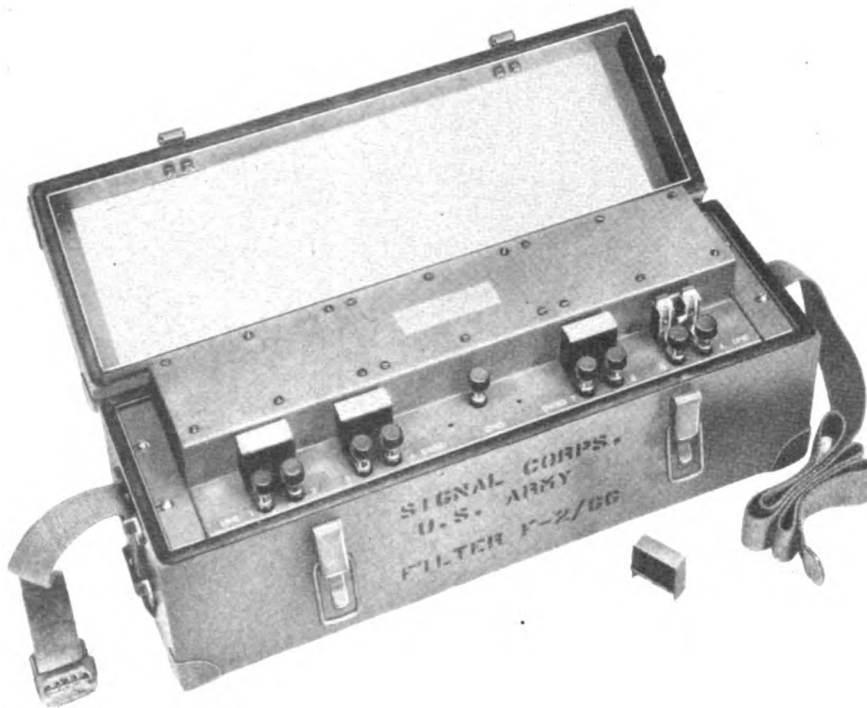
HOUSING: Canvas duck case with carrying strap.

OPERATION: Filters out carrier frequencies.

LINE TERMINATION: 2-wire.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	15.5	30
Total volume (cu ft).....	.23	1



F-2/GG

Figure 73. Filter F-2/GG.

Status: Standard. *Stock No.:* 3Z1893-10.
Reference: TM 11-2606.

Filter F-2/GG is an assembly of three filter unit sections and 2 peak limiters housed in a plywood weather proof case. The case has a removable hinged cover in the recess of which is mounted the operation instruction label. Each filter unit section consists of a network of inductances and capacitors in a 5¼-inch by 5¼-inch by 3¼-inch sealed metal can. The three filter unit sections are mounted on the under side of a 5¼-inch by 19-inch panel which is equipped with end brackets for mounting on the angle brackets of the outer case. The outer case is finished in olive drab, and it is equipped with a carrying strap. Panel binding posts are provided for line and switchboard connections at intermediate telephone stations.

Filter F-2/GG is a transfer filter used for bypassing the telegraph frequencies of the TH-1/TCC-1 around switchboards or dropping off the telegraph channel at an intermediate point. The F-2/GG consists of two band-stop filters and

one band-pass filter. The band-stop filters block the frequencies used for telegraph and permit free passage of remaining vf. The band-pass filter passes the telegraph frequencies and blocks all other frequencies in the voice range. Two peak limiters control the voltage of the telephone currents.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Band-stop filter attenuates the 1,680-cps and 1,860-cps telegraph frequencies 75 db. Deterioration of the telephone circuit is in the order of 5 db.

LOCATION IN SYSTEM: At switchboard or intermediate point on the line.

LIGHTNING PROTECTION: Carbon blocks at all line and switchboard binding posts.

HOUSING: 19-in. panel in wooden case.

LINE TERMINATION: 2-wire only.

DROP AND LOOP TERMINATIONS: 2-wire switchboard drops.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	30	45
Total volume (cu ft).....	1.5	2

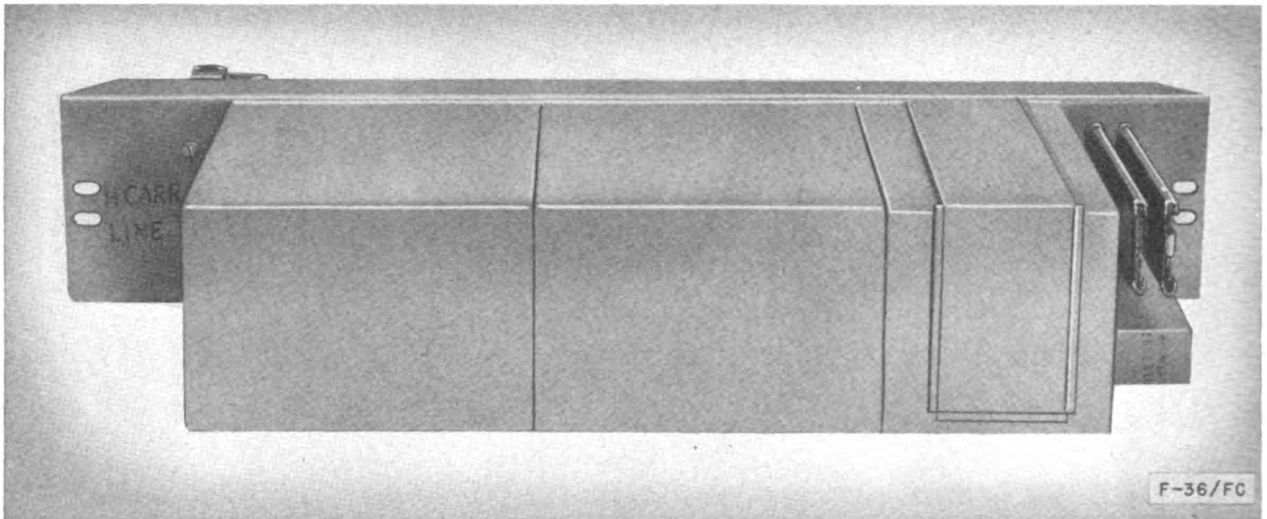


Figure 74. Carrier Filter F-36/FC.

Status: Limited/Std. *Stock No.:* 3Z1888-36.
Reference: TM 11-2025.

Carrier Filter F-36/FC is a type H line filter and balancing panel made up of one panel 3½ inches high and 19 inches wide. This panel contains a high-pass and a low-pass filter for separating the voice and carrier frequencies, and a filter network for correcting any unbalance caused by the insertion of the high- and low-pass filters on a carrier pair. Enough balancing filters are provided for balancing purposes when the carrier equipment is used on a physical 2-wire line or on a phantom group. This panel is connected between the line and a terminal or a repeater. Two of these panels are connected back to back when it is necessary to terminate the voice circuit at an intermediate point in the system, to bypass the carrier system around a v-f repeater, or to transfer the carrier circuit from one open wire line to another open wire line.

TECHNICAL CHARACTERISTICS

LOCATION IN SYSTEM: Line side of terminals and repeaters.

NOMINAL IMPEDANCE: Line side: 690 ohms at v-f; 600 ohms at H carrier frequencies. Drop side: 690 ohms for the low-pass filter; 600 ohms for the high-pass filter.

FREQUENCY CHARACTERISTICS:

Low-pass filter: Will pass 0 to 3,000 cps.

High-pass filter: Will pass over 3,800 upeps.

LINE TERMINATION: 2-wire.

CARRIER SIDE TERMINATION: V-f channel 2-wire.
 C-f channel 2-wire or 4-wire.

LOSSES: V-f circuit 0.2 db at 1,000 cps; phantom circuit .15 db at 1,000 cps.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	20	40
Total volume (cu ft).....	.36	2.9
Ship tons.....		.1

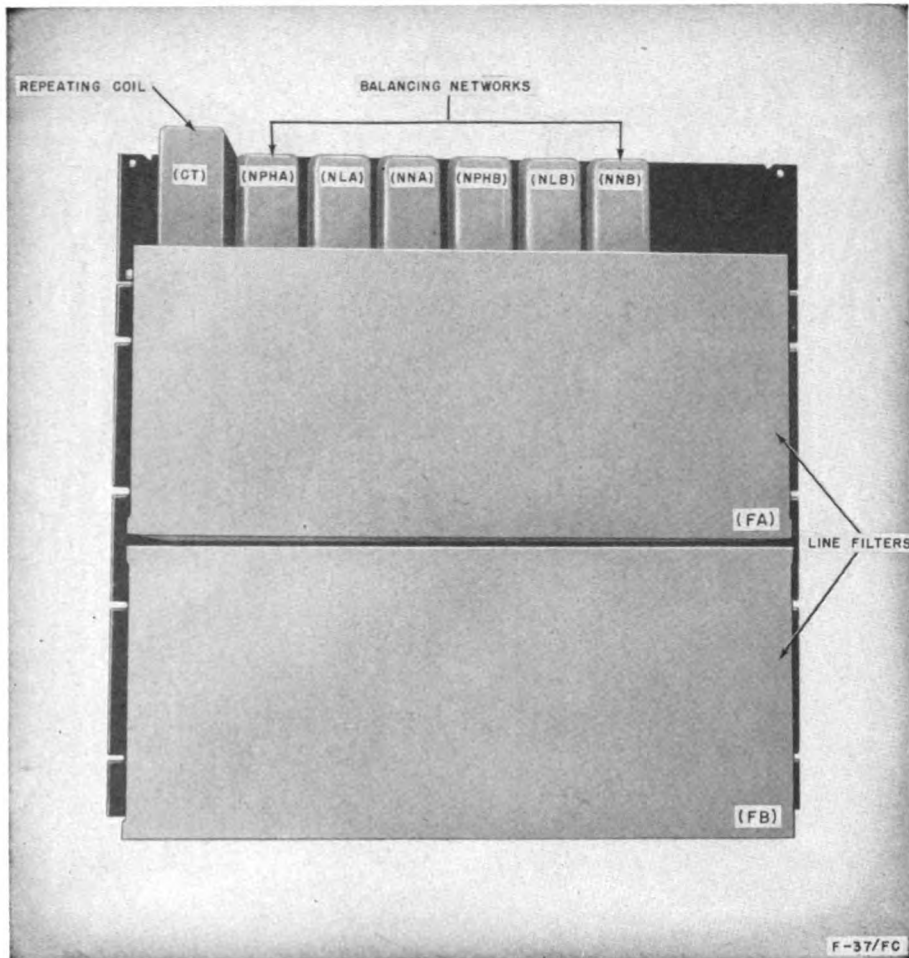


Figure 75. Carrier Filter F-37/FC.

Status: Limited/Std. *Stock No.:* 4C1806-4.
Reference: TM 11-2031.

Carrier Filter F-37/FC is a type C carrier-transfer panel consisting of two carrier-line filters, a carrier-transfer coil, and six balancing networks mounted on steel bars as an assembled unit. The unit is 17¹/₂ inches high and 19 inches wide, and it may be mounted on a 19-inch relay rack, or it may be mounted in a cabinet.

Carrier Filter F-37/FC is designed to separate v-f currents from type C carrier currents and to transfer line currents at type C carrier frequencies from one physical side circuit to another physical side circuit. Normally the Carrier Filter F-37/FC is used at any point where it is necessary to interrupt the continuity of the circuit on which type C carrier is superimposed, but where it is not desired to interrupt the continuity of the type C carrier path. The F-37/FC is designed for use

with circuits which are phantomed or nonphantomed, composited or noncomposited, simplexed or nonsimplexed, with or without v-f repeaters. Carrier Filter F-37/FC is used in conjunction with Carrier Terminals OA-11/FC and OA-12/FC and with Carrier Repeater OA-9/FC.

TECHNICAL CHARACTERISTICS

LOCATION IN SYSTEM: At C carrier circuit transfer point.

FREQUENCY CHARACTERISTICS:

Low-pass filter: Will pass 0 to 5 kc.

High-Pass filter: Will pass 6 kc to 31 kc.

LINE TERMINATION: 2-wire.

LOSSES: V-f circuit .2 db at 1,000 cps; phantom circuit .15 db at 1,000 cps.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	90	150
Total volume (cu ft).....	2.5	6.0
Ship tons.....		.2

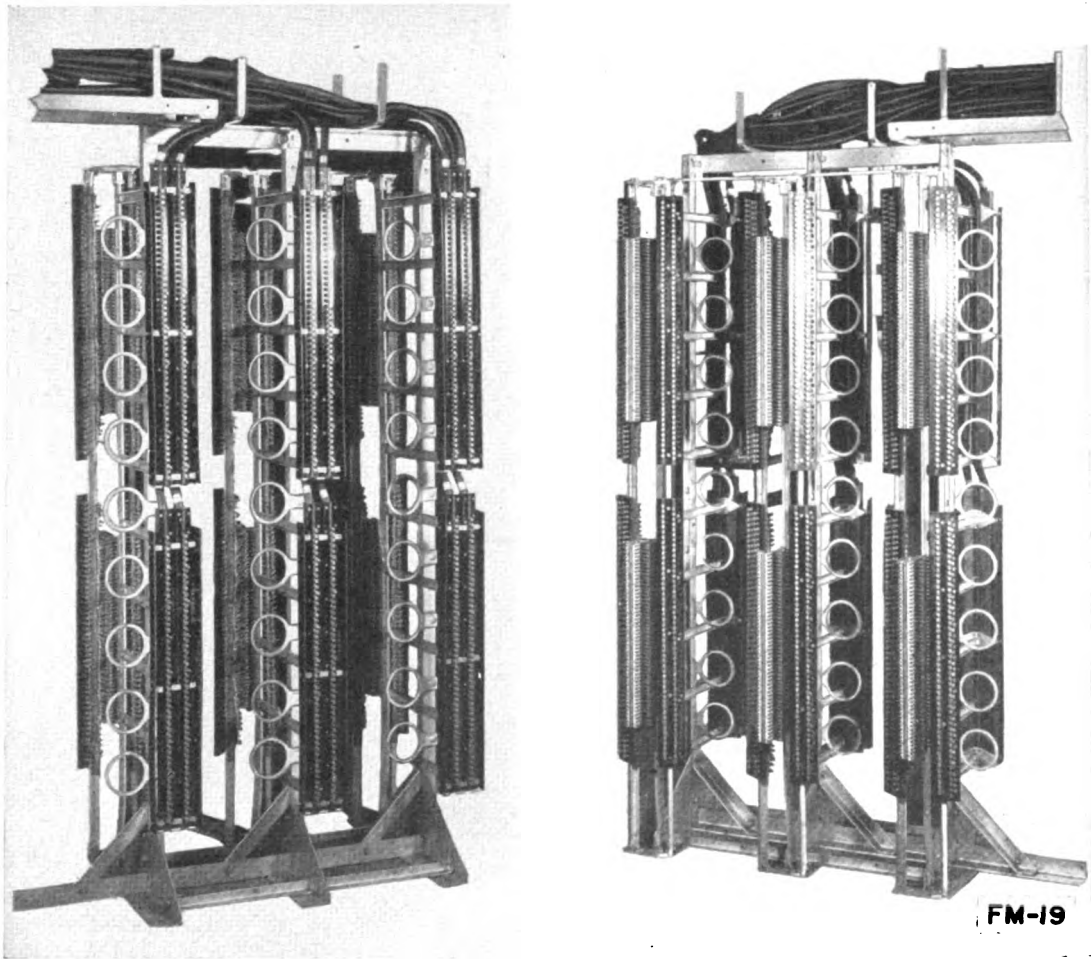


Figure 76. Line and switchboard sides of main distributing frame consisting of three Frames FM-19.

Status: Limited/Std. *Stock No.:* 4E2119. *Reference:* TM 11-338.

Frame FM-19 is a 100-line main distributing frame unit used to mount the line protection equipment and to furnish a cross-connecting frame between the line wires and the switchboard equipment. One Frame FM-19 is furnished with each Switchboard BD-80-(*) or BD-110-(*). When two or more Frames FM-19 are installed, they are bolted together to form a main distributing frame.

A series of binding posts is provided for terminating the field lines. Protectors are wired permanently between this series of binding posts and a second series of binding posts. This second series of binding posts is provided for cross-connecting to the binding post strips on the

switchboard side of the frame. Each binding post strip on the switchboard side is a part of Cord CD-338. The binding posts connect through the 35-foot rubber-jacketed cable to a spade terminal strip which engages with the binding post on the switchboard terminal panel.

TECHNICAL CHARACTERISTICS

LINE PROTECTION: Heat coils and carbon blocks.
NUMBER OF PROTECTED PAIRS: 100 per Frame FM-19.
INTERCONNECTION OF FRAME AND SWITCHBOARD: 4 ea Cord CD-333.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	180	703
Total volume (cu ft).....	9.5	22
Ship tons.....		.6

Note. Packed in Case CS-59 for Army transportation.

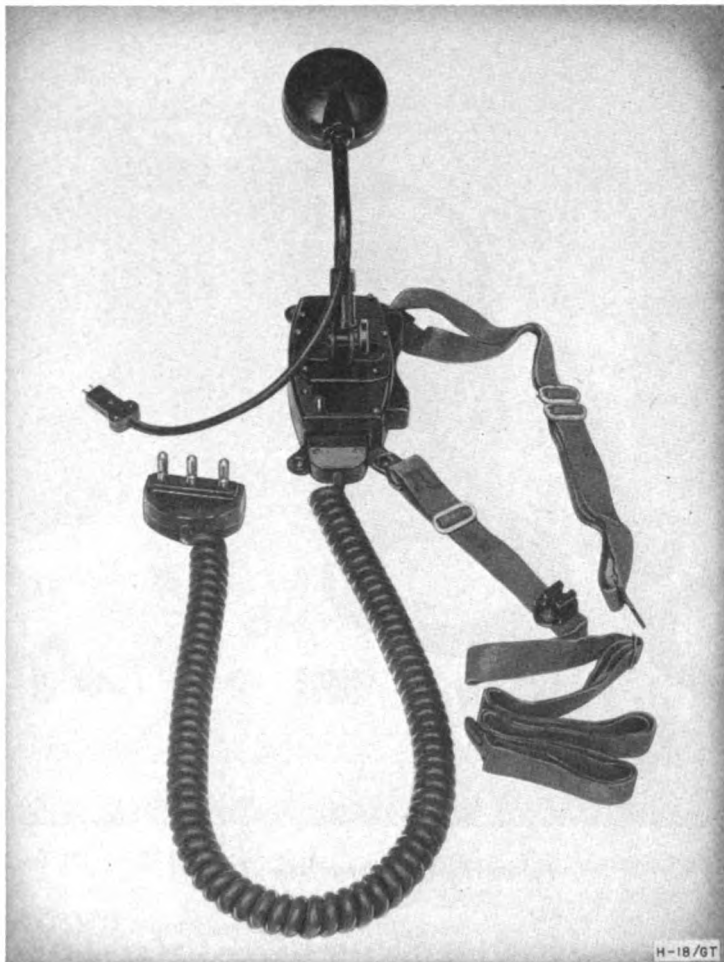


Figure 77. Chest Set H-18/GT.

Status: Standard. *Stock No.:* 4B422-18. *Reference:* TM 11-336.

Chest Set H-18/GT is a telephone transmitter and associated equipment which provides facilities for connecting a headset and a microphone. It consists of a chest unit to which is attached an adjustable transmitter arm, two straps, and one cord.

The chest unit contains two jack assemblies: One jack assembly is for connecting a headset, and the other is for connecting a transmitter or microphone. A plug assembly is included for connecting the cord. It also includes a lever-type, hold-on, lock-on switch assembly. Chest Set H-18/GT is used with Switchboards BD-91 and BD-96.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Chest Unit H-17/GT.....	1
Cord CX-67/GT.....	1
Plug U-31/GT.....	1

EQUIPMENT USED WITH H-18/GT

Microphone T-30-U.
 Microphone T-45.
 Headset HS-30-U.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	0.8	3.8
Total volume (cu ft).....	.09	.16

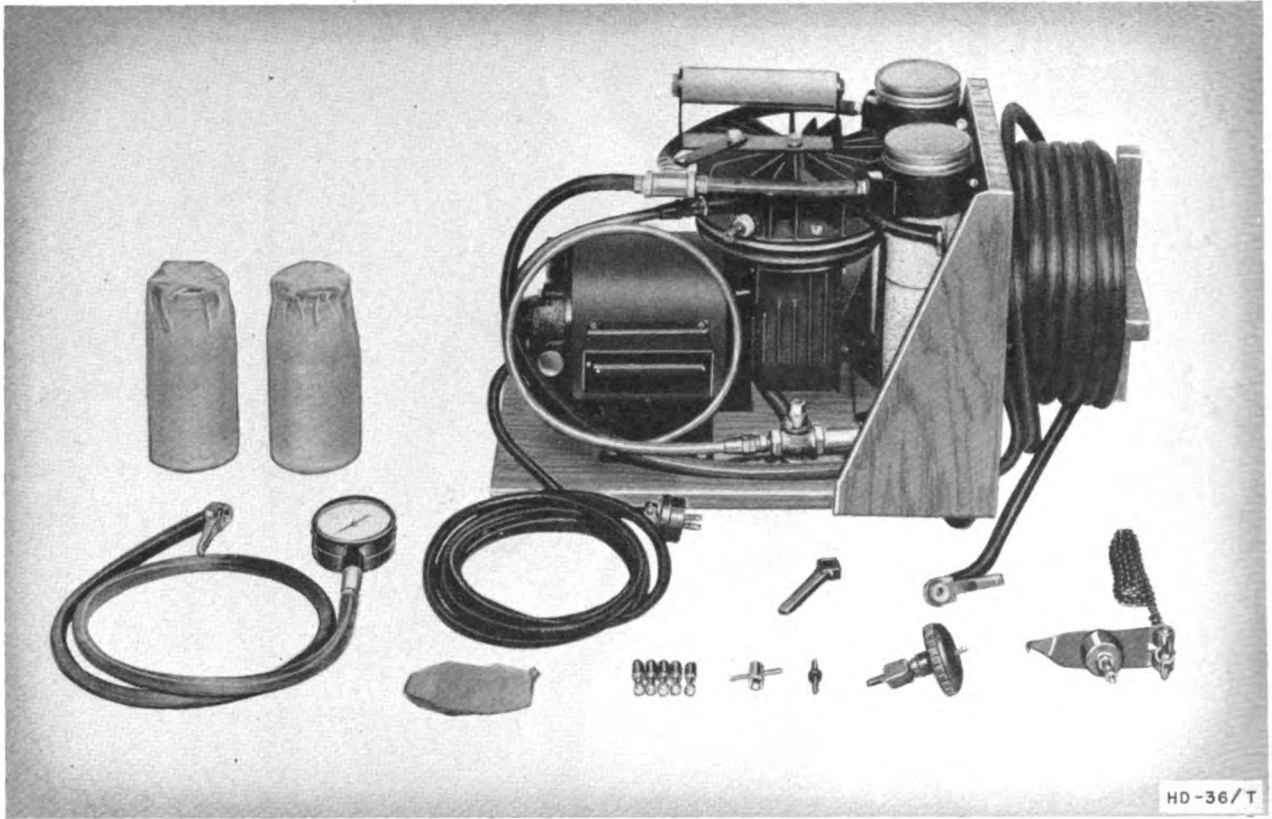


Figure 78. Air Compressor HD-36/T.

Status: Standard. Stock No.: 3H1000. Reference: TM 11-2539.

Air Compressor HD-36/T is a compact, lightweight, electrically driven, semidiaphragm type, air-compressing unit. The major assemblies, consisting of the driving motor, compressor unit, drying jars, hose, and attaching cable, are mounted on a plywood support and are inclosed in a wooden case for transportation. Air Compressor HD-36/T is similar to Air Compressor HS-37/T except that the HD-36/T has an a-c driving motor and the HD-37/T has a d-c driving motor.

Air Compressor HD-36/T is used for flash testing of lead-covered telephone cable splices, location of openings in a cable sheath, and for the removal of moisture from a lead-sheathed telephone cable. It is used in the maintenance of lead-sheathed telephone cable used in the outside

plant of permanent or semipermanent installations of the base sections of the communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER SUPPLY REQUIRED: 115 v, 60 cyc ac.

COMPRESSOR:

Make: Dapco.

Capacity: 5 cfm at 15 lb.

PRINCIPAL COMPONENTS

Component	Quantity
Cable testing unit.....	1
Motor with capacitor.....	1
Compressor.....	1
Mounting base.....	1
Carrying case.....	1
Drierite, service bottle.....	2

WEIGHT AND VOLUME

	Unpacked
Total weight (lb).....	226
Total volume (cu ft).....	3

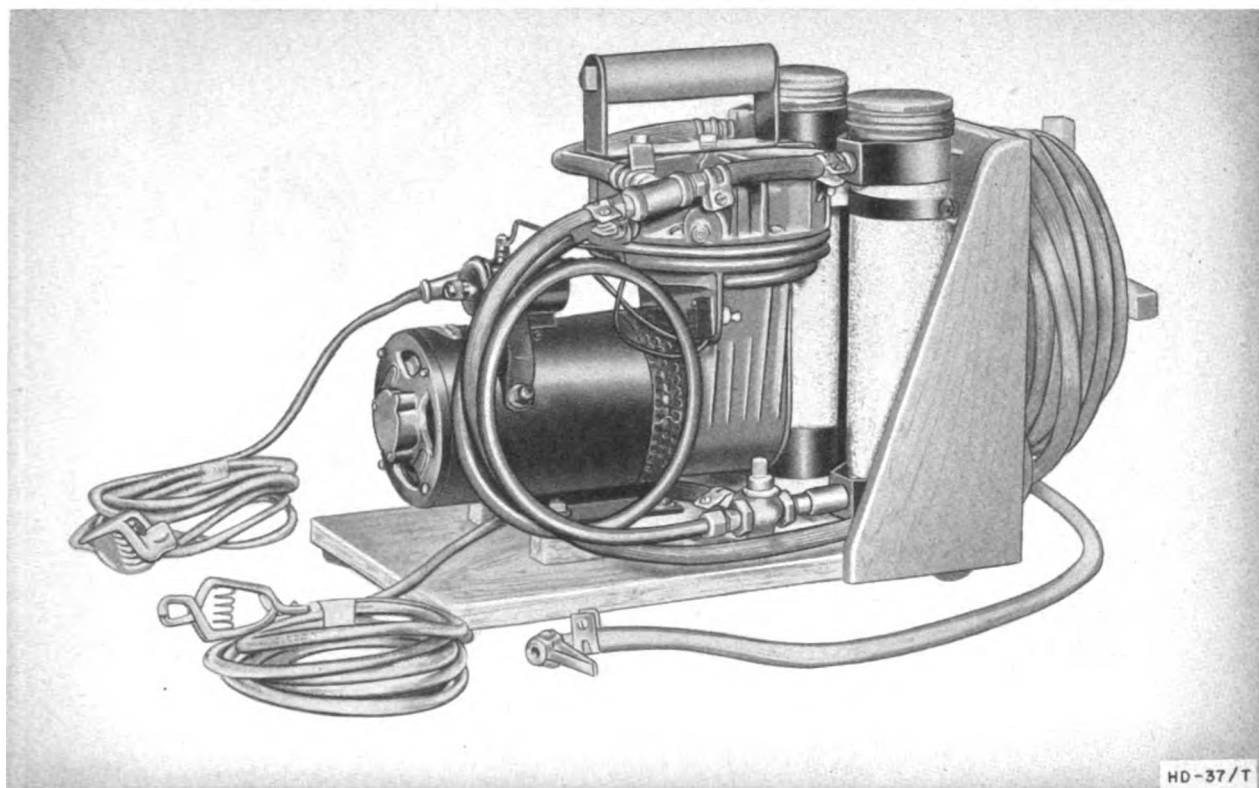


Figure 79. Air Compressor HD-37/T.

Status: Standard. *Stock No.:* 3H1000.1. *Reference:* TM 11-2539.

Air Compressor HS-37/T is a compact, light-weight, electrically driven, semidiaphragm type, air-compressing unit. The major assemblies, consisting of the driving motor, compressor unit, drying jars, hose, and attaching cable, are mounted on a plywood support and are inclosed in a wooden case for transportation. Air Compressor HD-37/T is similar to Air Compressor HD-36/T except that the HD-37/T has a d-c driving motor and the HD-36/T has an a-c driving motor.

Air Compressor HD-37/T is used in locations where ac is not available, for flash testing of lead-covered telephone cable splices, location of openings in a cable sheath, or for the removal of moisture from lead-sheathed telephone cables. It is used in the maintenance of lead-sheathed telephone cable used in the outside plant of permanent or

semipermanent installations of the base sections of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER SUPPLY REQUIRED: 6-v dc, storage battery.
COMPRESSOR:

Make: Dapco.

Capacity: 5 cfm at 15 lb.

PRINCIPAL COMPONENTS

Component	Quantity
Cable testing unit.....	1
Motor with solenoid switch.....	1
Compressor.....	1
Mounting base.....	1
Carry case.....	1
Drierite, service bottle.....	2

WEIGHT AND VOLUME

	Unpacked
Total weight (lb).....	217
Total volume (cu ft).....	3

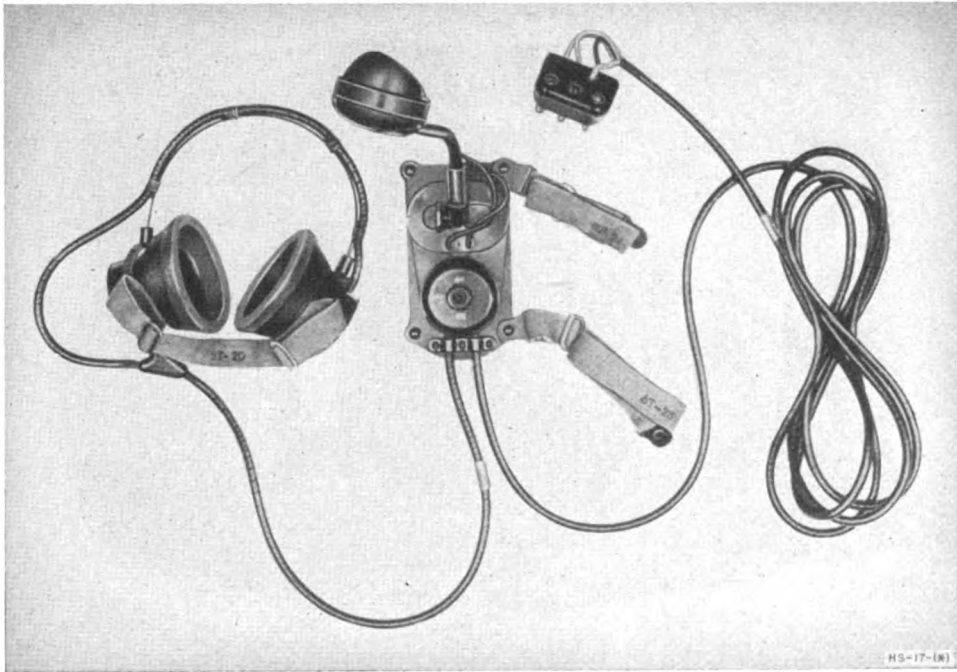


Figure 80. Head and Chest Set HS-17-(*).

Status: Limited/Std. *Stock No.:* 4B1277.

Head and Chest Set HS-17-(*), represents many models of the HS-17. It consists of two receivers with Cushions MC-114. The receivers are connected to a chest unit type transmitter, which is equipped with a press-to-talk switch on the chest plate.

Head and Chest Set HS-17-(*), is moisture-resistant and can be used with Telephones EE-8-(*), and EE-91.

TECHNICAL CHARACTERISTICS

TYPE OF RECEIVER: R-21 (compensated magnet-type).
 IMPEDANCE OF SET AT 1,000 CPS: 256 ohms.
 D-C RESISTANCE OF EACH RECEIVER: 27 ohms.
 D-C RESISTANCE OF THE TRANSMITTER: 75 ohms.
 NUMBER OF CONDUCTORS IN THE CORD: 3.
 CORD TERMINATION: Plug PL-58.

WEIGHT AND VOLUME

	<i>Export pack</i>
Total weight (lb).....	4.2
Total volume (cu ft).....	.4

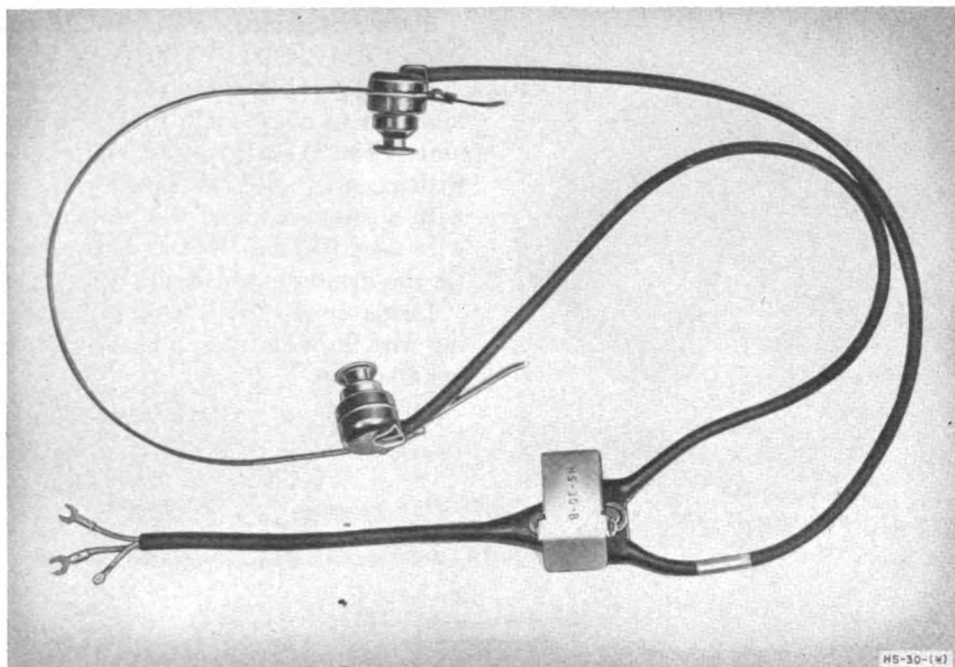


Figure 81. Headset HS-30-(B).

Status: Standard. *Stock No.:* 2B830.

Headset HS-30-(*) is a double, insert-type, receiver headset equipped with ear Insert M-300. The HS-30-(*) may be equipped with one of several types of cords; namely, Cords CD-605, CD-604, CD-307-A, CD-874, or CD-933.

Headset HS-30-(*) is used by the Air Force and the Ground Forces as a telephone or radio receiving headset.

TECHNICAL CHARACTERISTICS

TYPE OF RECEIVER: R-30-(*) compensated magnetic.
 IMPEDANCE OF SET AT 1,000 CPS: 256 ohms.

D-C RESISTANCE OF EACH RECEIVER: 75 ohms.
 NUMBER OF CONDUCTORS IN CORD: 3.

CORD TERMINATION: Spade terminals or plug.

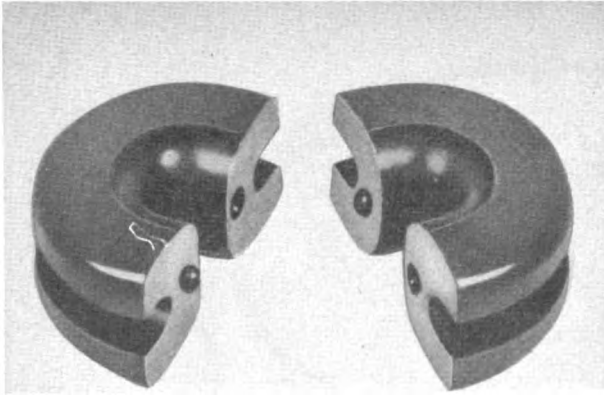
CORDS:

- CD-605: High-impedance single cord.
- CD-604 with CD-307-A: High-impedance bail-out.
- CD-874: Low-impedance single cord.
- CD-933 with CD-307-A: Low-impedance bail-out.

Note. When HS-30-(*) is used with Cord CD-604 or CD-605, which include Coil C-410, the impedance of the set is 8,000 ohms.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	0.5	1.9
Total volume (cu ft).....		.26



IL-3/G

Figure 82. Insulator IL-3/G.

Status: Standard. *Stock No.:* 3G569B-1. *Reference:* FM 24-20.

Insulator IL-3/G is a forestry-type insulator modified to obtain min practical weight and volume. The IL-3/G is split and elliptical in shape with a center hole $\frac{3}{4}$ by $\frac{3}{8}$ inch wide. It is equipped with a groove around the periphery to retain the wire used to hold the two halves together and to tie the insulator to its support.

Insulator IL-3/G is used primarily for supporting wire lines on trees in heavily wooded or jungle installations.

DIMENSIONS

Height (in.)	Width (in.)	Depth (in.)
2	$2\frac{3}{8}$	$1\frac{1}{16}$



Figure 83. Insulator IN-15.

Status: Standard. *Stock No.:* 3G515. *Reference:* TM 11-2262.

Insulator IN-15 is a cylindrical, knob-shaped, transparent, lime-glass insulator of the single-groove, single-petticoat type. The IN-15 is designed for use on open wire telephone transmission lines to support and insulate the open wire from the wooden cross arm.

DESCRIPTIVE DATA

- OVER-ALL DIAMETER: $3\frac{1}{4}$ in.
- BASE OUTSIDE DIAMETER: $2\frac{13}{16}$ in.
- INSIDE DIAMETER: 2 in.
- PINHOLE: 1-in. diam.
- WIRE GROOVE: 1 ea; $\frac{1}{2}$ in. wd.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
1.45	$3\frac{3}{8}$	$2\frac{13}{16}$	$2\frac{13}{16}$



Figure 84. Insulator IN-128.

Status: Standard. *Stock No.:* 3G1815-53. *Reference:* TM 11-2262.

Insulator IN-128 is a conical, colorless glass insulator of the double-groove type. The IN-128 is designed for use on open wire telephone transmission lines at transposition points and at points where wires are dead-ended in two directions at a single cross arm.

DESCRIPTIVE DATA

OVER-ALL DIAMETER: 4 in.
 BASE OUTSIDE DIAMETER: $3\frac{3}{16}$ in.
 INSIDE DIAMETER: $2\frac{1}{4}$ in.
 PIN HOLE: 1-in. diam.
 WIRE GROOVES: 2 ea; $\frac{3}{8}$ in. wd.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
2.4	$3\frac{3}{8}$	4	4

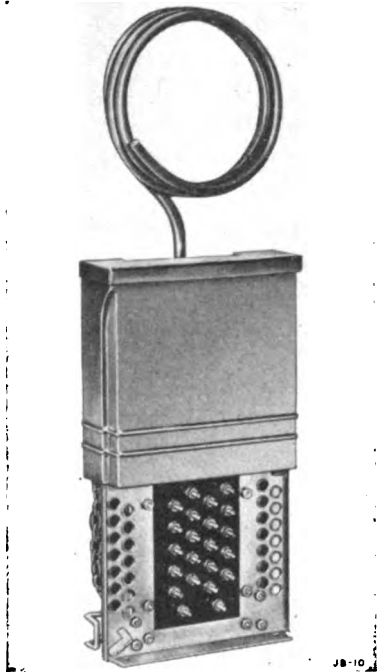


Figure 85. Terminal Box JB-10.

Status: Standard. *Stock No.:* 5C2710, reversible; 5C2710T, nonreversible. *Reference:* TM 11-2262.

Terminal Box JB-10 is a moistureproof cable terminal consisting of a cable chamber, faceplate, and slip-on sheet metal cover. The cable chamber is of heavy, hot-galvanized steel. The cable

enters through a wall in the chamber into which solder is puddled so that a strong moistureproof connection is made. The faceplate and fanning strips are made of a single piece of molded bakelite. Ample room is provided on both sides of the faceplate for jumper wires which are taken through to openings at the bottom of the terminal. The zinc slip-on cover is attached to the terminal with a heavy chain. Terminal JB-10 is equipped with a 6-foot cable stub, which is sealed to the cable chamber.

Terminal Box JB-10 is used to terminate paper-insulated, lead-sheathed, distribution cables. It provides a moistureproof unprotected termination for the cables and a connecting point for the drop wires. Terminal Box JB-10 can be installed outside on poles or on the walls of buildings; it may also be installed inside buildings. It is intended for use in permanent or semipermanent telephone systems in the communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

NUMBER OF PAIRS: 10.
 SIZE OF CONDUCTORS IN CABLE STUB: #22 B & S gage.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)-----	15	22
Total volume (cu ft)-----	1.0	2
Ship tons-----		.05

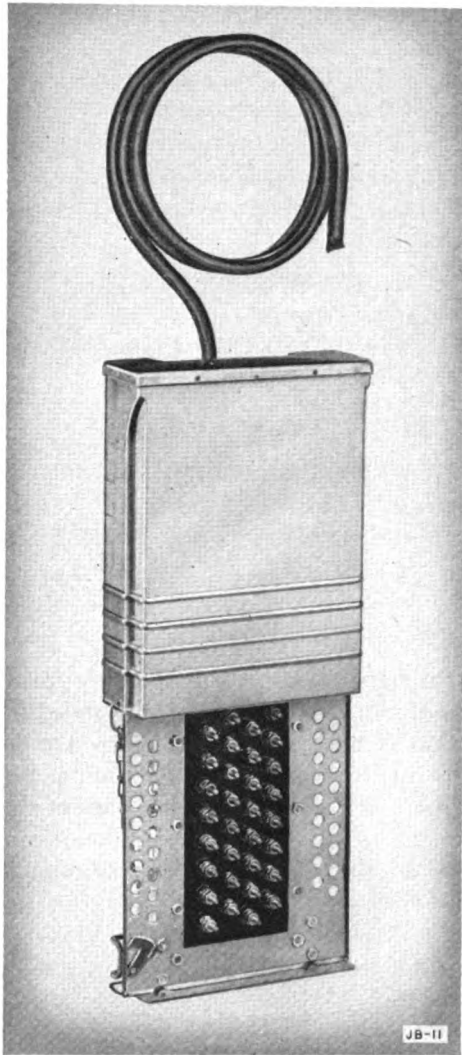


Figure 86. Terminal Box JB-11.

Status: Standard. *Stock No.:* 5C2711, reversible; 5C2711L, bottom stub entrance; 5C2711T, top stub entrance. *Reference:* TM 11-2262.

Terminal Box JB-11 is a moistureproof cable terminal consisting of a cable chamber, faceplate, and slip-on sheet metal cover. The cable chamber is of heavy, hot-galvanized steel. The cable enters through a wall in the chamber into which solder is puddled so that a strong moistureproof connection is made. The faceplate and fanning strips are made of a single piece of molded bakelite. Ample room is provided on both sides of the faceplate for jumper wires which are taken through the openings at the bottom of the terminal. The zinc slip-on cover is attached to the terminal with a heavy chain. Terminal JB-11 is equipped with a 6-foot cable stub.

Terminal Box JB-11 is used to terminate paper-insulated, lead-sheathed distribution cables. It provides a moistureproof unprotected termination for the cables and a connecting point for the drop wires. Terminal Box JB-11 can be installed outside on poles or on the walls of buildings; it may also be installed inside buildings. It is intended for use in permanent or semipermanent telephone systems in the communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

NUMBER OF PAIRS: 16.

SIZE OF CONDUCTORS IN CABLE STUB: #22 B & S gage.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	15	22
Total volume (cu ft).....	1.0	2
Ship tons.....	-----	.05

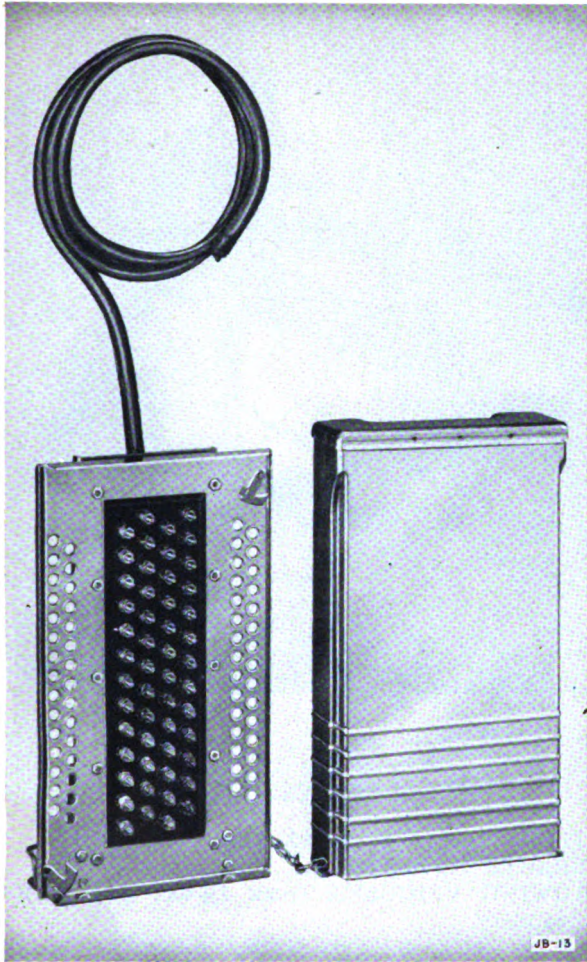


Figure 87. Terminal Box JB-13.

Status: Standard. *Stock No.:* 5C2713, reversible; 5C2713T, top stub entrance only. *Reference:* TM 11-2262.

Terminal Box JB-13 is a moistureproof cable terminal consisting of a cable chamber, faceplate, and slip-on sheet metal cover. The cable chamber is of heavy, hot-galvanized steel. The cable enters through a wall in the chamber into which solder is puddled so that a strong moistureproof connection is made. The faceplate and fanning strips are made of a single piece of molded bakelite. Ample room is provided on both sides of the faceplate for jumper wires which are taken through to openings at the bottom of the terminal. The zinc slip-on cover is attached to the terminal with a heavy chain. Terminal JB-13 is equipped with a 6-foot cable stub, which is sealed to the cable chamber.

Terminal Box JB-13 is used to terminate paper-insulated, lead-sheathed, distribution cables. It provides a moisture proof unprotected termination for the cables and a connection point for the drop wires. Terminal Box JB-13 can be installed outside on poles or on the walls of buildings; it may also be installed inside buildings. The JB-13 is intended for use in permanent or semipermanent telephone systems in the communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

NUMBER OF PAIRS: 26.

SIZE OF CONDUCTORS IN CABLE STUB: #22 B & S gage.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	22	29
Total volume (cu ft).....	1.1	2.2
Ship tons.....		.055

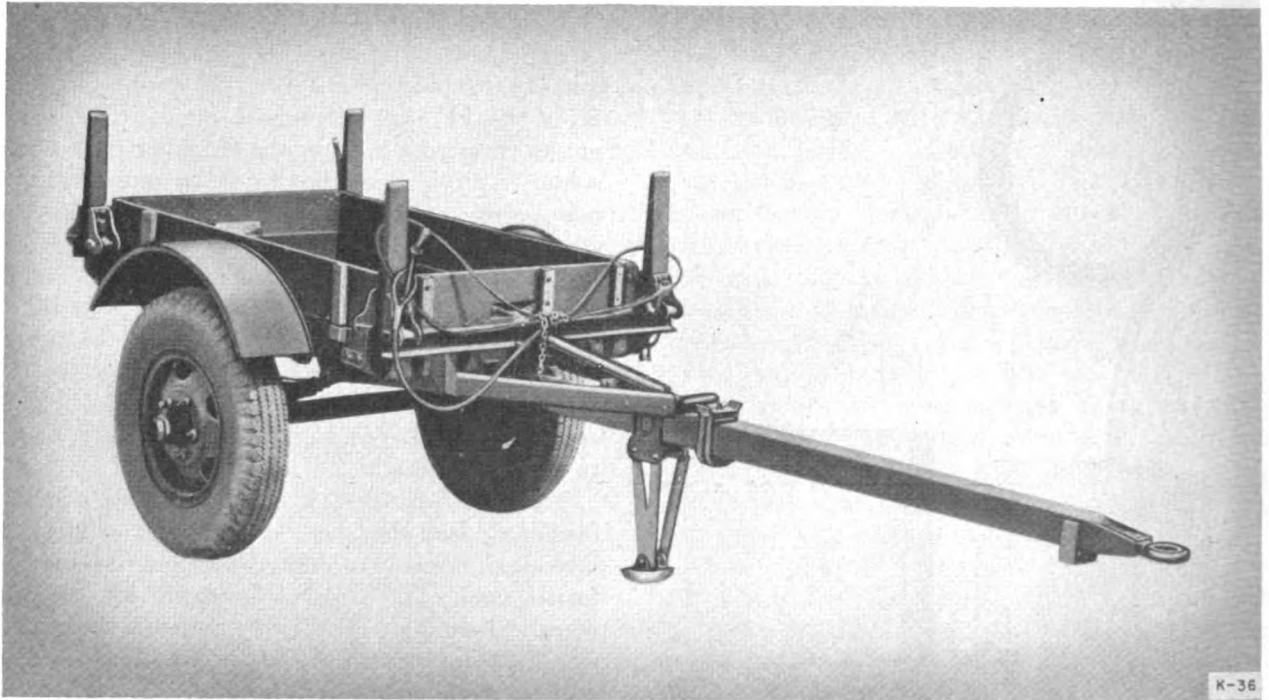


Figure 88. Trailer K-36.

Status: Limited/Std. Stock No.: 6J936. Reference: TM 9-2800.

Trailer K-36 is a two-wheel, cargo-conversion type body trailer used by Signal Corps troops to transport poles for telephone lines or general cargo.

EQUIPMENT DATA

PAYLOAD: 4,000 lb.
 LOADING HEIGHT: 42 in.
 GROUND CLEARANCE: 16 in.

TIRES: 2 ea; ply-8; size 8.25 x 20.

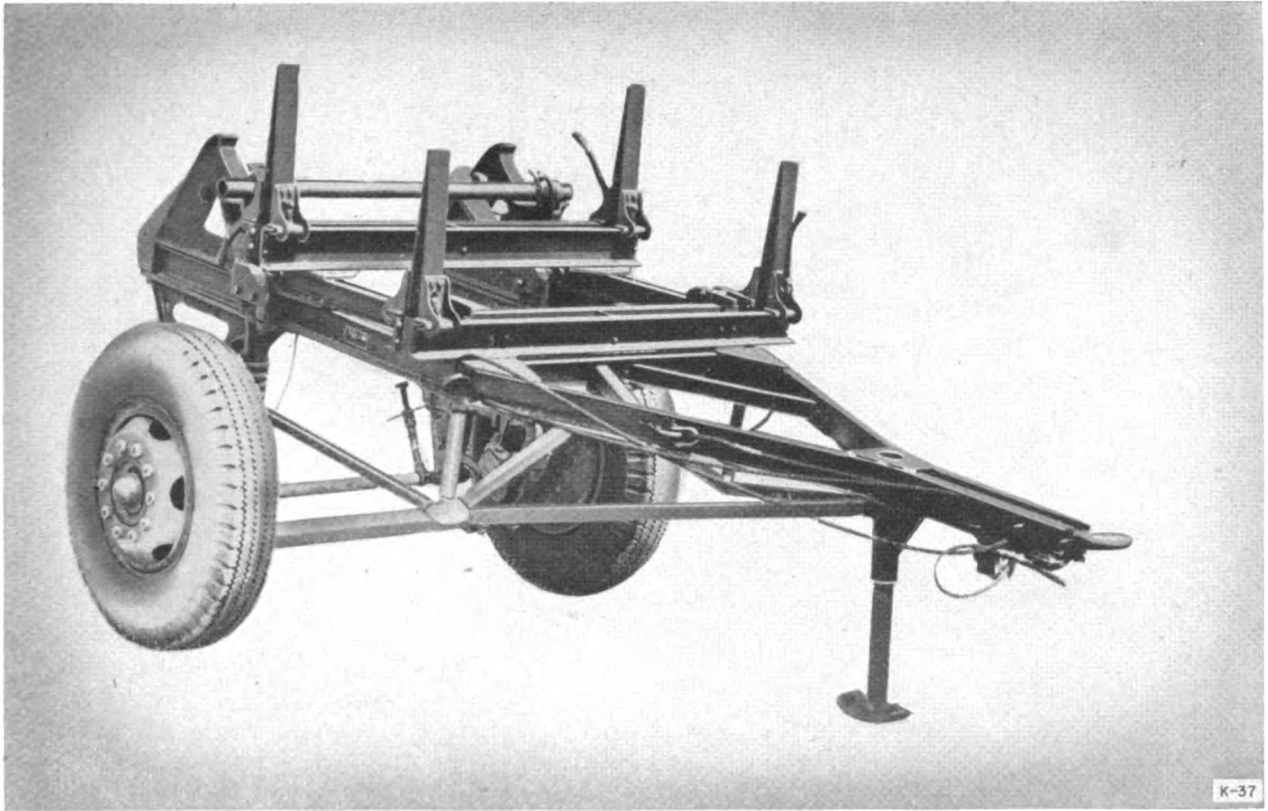
BRAKES: Service; electric.

TOWING VEHICLES: Truck 1½-ton, 4 x 4; K-42 capacity.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	1, 815	2, 922
Total volume (cu ft) ¹ -----	346	233. 9
Ship tons-----	-----	5. 9

¹ Assembled.



K-37

Figure 89. Trailer K-37.

Status: Standard. Stock No.: 6J937 represents K-37 and K-37-A. Trailer K-37-(*).

Trailer K-37-(*), is a two-wheel, 5-ton cable and pole hauling trailer used by Signal Corps troops for transporting cable reels or poles for telephone lines.

EQUIPMENT DATA

	K-37	K-37-A
PAYLOAD.....	10,000 lb..	10,000 lb.
LOADING HEIGHT.....	42 in.....	42 in.
GROUND CLEARANCE.....	9 in.....	9 in.
TIRES.....	2 ea; ply-12; size 10 x 20.	2 ea; ply-16; size 12 x 20; 7½-in. tread.

	K-37	K-37-A
BRAKES.....	Service; electric.	Service; electric.
TOWING VEHICLES.....	Truck 1½-ton, 4 x 4; K-42, K-43, K-44.	Truck 1½-ton, 4 x 4; K-42, K-43, K-44.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	2,900	4,105
Total volume (cu ft) ¹	540	299
Ship tons.....		7.2

¹Assembled.

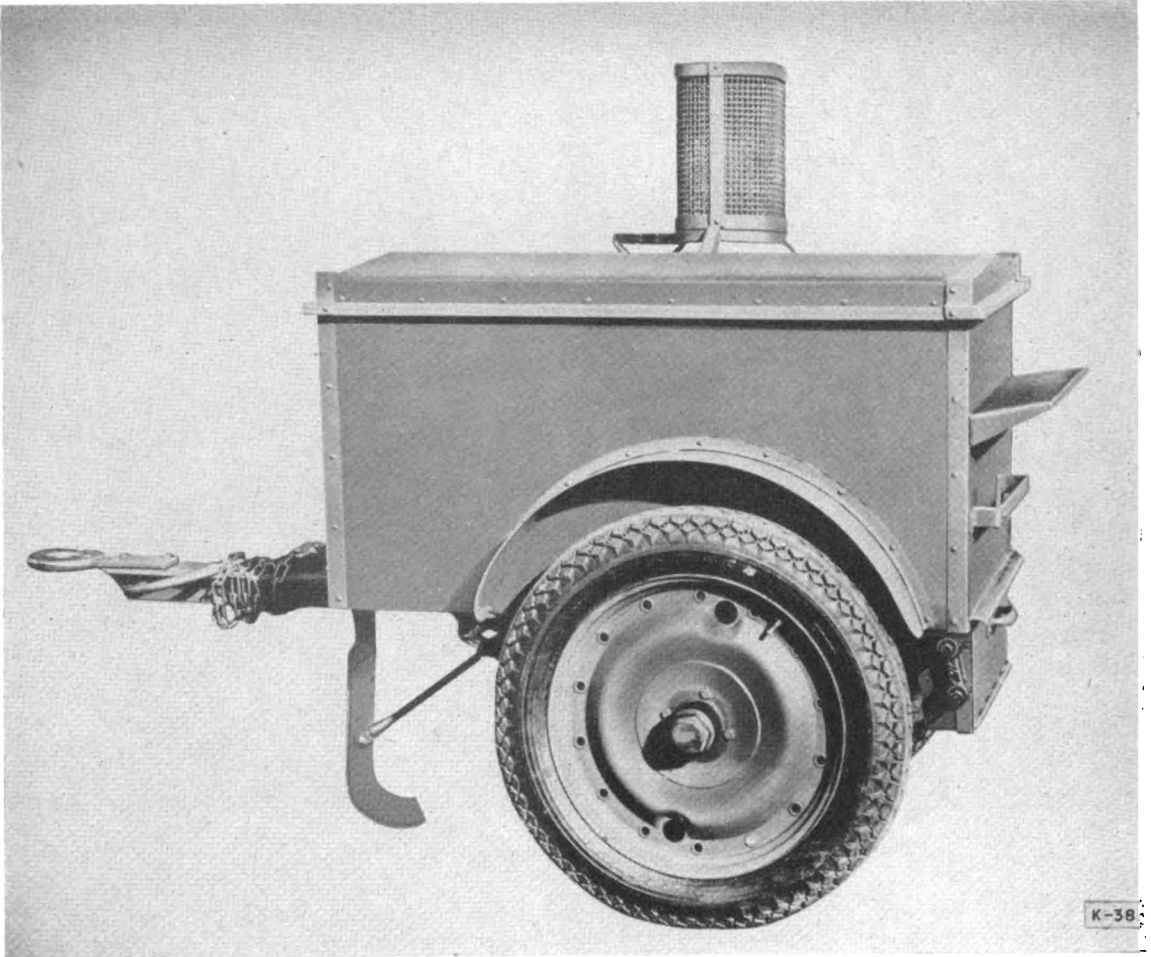


Figure 90. Trailer K-38.

Status: Standard. Stock No.: 6J938 (K-38) and 6J938A (K-38-A). Reference: TM 9-2800.

Trailer K-38-(*) represents K-38 and K-38-A. Trailer K-38-(*) is a two-wheel, $\frac{1}{4}$ - or $\frac{3}{8}$ -ton trailer used by the Signal Corps to store and transport cable splicer's Tool Equipment TE-56.

Trailer K-38 has a chest-type body, and Trailer K-38-A has a cargo-type body with two detachable steel chests.

EQUIPMENT DATA

	K-38	K-38-A
PAYLOAD.....	500.....	460.
LOADING HEIGHT..	Not applicable.	40 $\frac{1}{4}$ in.
GROUND CLEAR- ANCE.	7 $\frac{1}{2}$ in.....	12 $\frac{1}{2}$ in.

WEIGHT AND VOLUME

	K-38		K-38-A	
TIRE.....	2 ea; ply-4; size 4.00 x 18.		2 ea; ply-6; size 6.00 x 16.	
BRAKES.....	None.....		Parking, hand mechanical.	
TOWING VEHICLE..	Any vehicle equipped with a pintle hook.		Truck $\frac{1}{4}$ -ton and $\frac{3}{4}$ -ton, 4 x 4.	
	Unpacked		Export pack	
	K-38	K-38-A	K-38	K-38-A
Total weight (lb).....	410	865	655	1,110
Total volume (cu ft).....	72	144	175	247
Ship tons.....			4.4	6



Figure 91. Truck K-42.

Status: Limited/Std. *Stock No.:* 6J1042. *Reference:* TM 9-2800.

Truck K-42 is a 1½-ton, 4-by-4 vehicle equipped with a pole derrick and power take-off but without a winch. It provides mobile facilities for telephone line construction and maintenance.

Truck K-42 is used by the Signal Corps troops for general line construction and maintenance of outside plant.

GENERAL DATA

CREW: 2.

REAR AXLE:

Gear ratio: 6.67:1.

AXLE LOAD (lb):

Loaded: Front—4,250; rear—8,050.

TIRES: Ply-8; size 7.50 x 20; pressure 55 lb.

VEHICLE DIMENSIONS:

Loading height: 44 in.

Ground clearance: 10 in.

Pintle height: Loaded 19½ in.; empty 32 in.

ELECTRICAL SYSTEM:

1 ea storage battery: 6 v.

CAPACITIES:

Fuel (70-octane gasoline): 35 gal.

Cooling system: 17¼ qt.

Crankcase (refill): 5 qt.

Transmission: 2¾ qt.

Differential: Front—7 qt; rear—7 qt.

BRAKES:

Type: Hydraulic-hydrovac.

Dimensions: Front 2 in.; rear 3 in.

TRANSMISSION SPEEDS: 4.

TRANSFER CASE SPEEDS: 2.

PERFORMANCE

MAX. COMPUTED GRADABILITY: 5%.

TURNING RADIUS: 29½ ft.

FORDING DEPTH: 29 in.

ANGLE OF APPROACH: 54°.

ANGLE OF DEPARTURE: 35°.

ALLOWABLE SPEED (governed): 48 mph.

MAX. RECOMMENDED TOWED LOAD: 4,000 lb.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	12,300	13,140
Total volume (cu ft).....	1,220	1,315
Ship tons.....		33



Figure 92. Truck K-43.

Status: Limited/Std. *Stock No.:* 6J1043. *Reference:* TM 9-2800.

Truck K-43 is a 1½-ton, 4-by-4 vehicle equipped with a winch, pole derrick, and power take-off. It provides mobile facilities for telephone line construction and maintenance.

Truck K-43 is used by the Signal Corps for general line construction and maintenance of outside plant.

GENERAL DATA

CREW: 2.

REAR AXLE:

Gear ratio: 6.67:1.

AXLE LOAD (lb.):

Loaded: Front—4,250; rear—8,050.

TIRES: Ply-8; size 7.50 x 20; pressure 55 lbs.

VEHICLE DIMENSIONS:

Loading height: 44 in.

Ground clearance: 10 in.

Pintle height: Loaded 19½ in.; empty 32 in.

ELECTRICAL SYSTEM:

Voltage: 6 v.

Power source: 1 ea storage battery.

CAPACITIES:

Fuel (70-octane gasoline): 35 gal.

Cooling system: 17¼ qt.

Crankcase (refill): 5 qt.

Transmission: 2¾ qt.

Differential: Front—7 qt; rear—7 qt.

BRAKES:

Type: Hydraulic-hydrovac.

Dimensions: Front—2 in.; rear—3 in.

TRANSMISSION SPEEDS: 4.

TRANSFER CASE—SPEEDS: 2.

PERFORMANCE

MAX. COMPUTED GRADABILITY: 5 percent.

Turning radius: 29½ ft.

Fording depth: 29 in.

Angle of approach: 54°.

Angle of departure: 35°.

Allowable speed (governed): 48 mph.

Max. recommended towed load: 4,000 lb.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	12,300	13,140
Total volume (cu ft).....	1,220	1,315
Ship tons.....		33

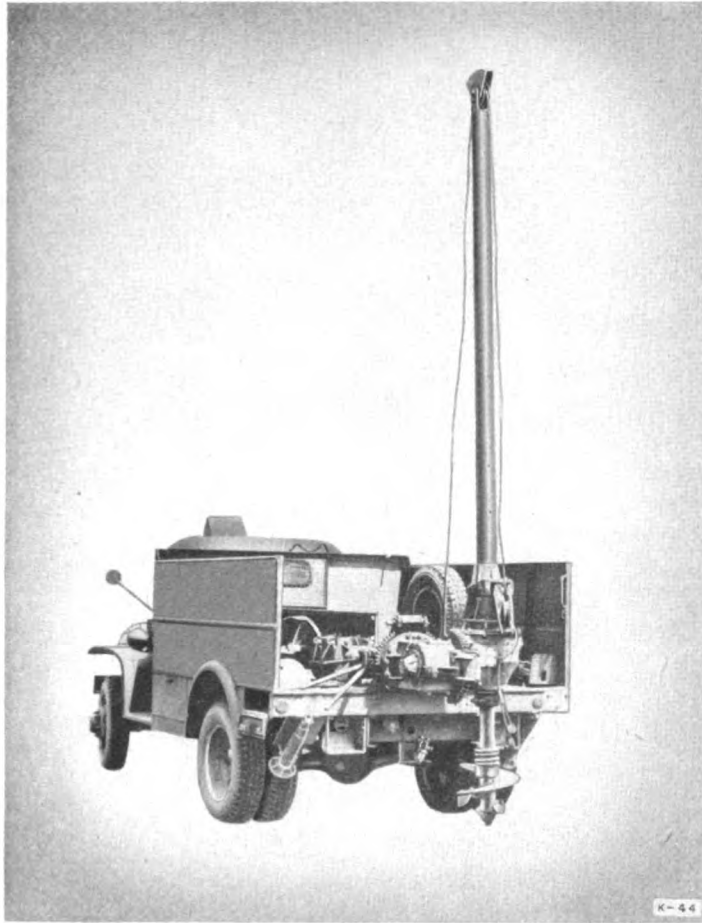


Figure 93. Truck K-44.

Status: Limited/Std. Stock No.: 6J1044.

Truck K-44- (*) represents models A through F of the K-44. Truck K-44- (*) is a 1½-ton, 4-by-4 vehicle equipped with a special body which includes an earth-borer and a pole-setter.

Truck K-44- (*) is used by the Signal Corps for boring pole holes and setting poles when constructing and maintaining telephone pole lines.

GENERAL DATA

CREW: 2.

REAR AXLES:

Gear ratio: 6.67:1.

AXLE LOAD:

Load (lb): Front—3,640; rear—8,895.

TIRES: Ply-8; size—7.50 x 20; pressure 55 lb.

GROUND CLEARANCE: 9¾ in.

ELECTRICAL SYSTEM:

Voltage: 6 v.

Battery: 1.

CAPACITIES:

Fuel: 30 gal.

Cooling system: 17¼ qt.

Crankcase (refill): 5 qt.

Transmission: 2¾ qt.

Differentials: Front—7 qt; rear—7 qt.

BRAKES:

Type: Hydraulic-hydrovac.

Dimensions: Front—2 in.; rear—3 in.

TRANSMISSION SPEEDS: 4.

TRANSFER CASE—SPEEDS: 2.

PERFORMANCE

MAX. COMPUTED GRADABILITY: 65 percent.

TURNING RADIUS: 29½ ft.

FORDING DEPTH: 29 in.

ALLOWABLE SPEED: 48 mph (governed).

ADDITIONAL DATA:

Auger engine: Buda; model HP217; brake hp at 1,600 rpm—43; max governed speed—1,600 rpm.

HOLE SIZED: 9-, 12-, 16-, or 20-in; diam, max 7½ ft deep.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	12, 535	13, 775
Total volume (cu ft).....	1, 507. 5	1, 660
Ship tons.....		41. 5

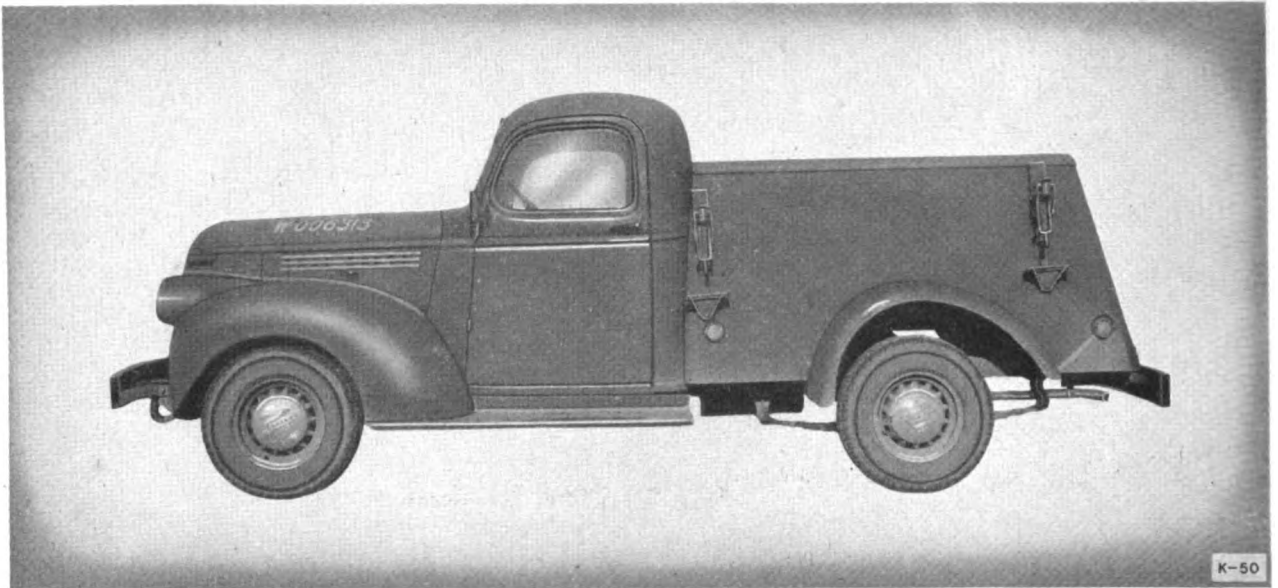


Figure 94. Truck K-50.

Status: Standard. Stock No.: 6J1050 (K-50) and 6J1050A (K-50-A). Reference: See note below.

Truck K-50-(*) represents K-50 and K-50-A. Truck K-50-(*) is a ½-or ¾-ton vehicle equipped with a special body. Truck K-50-(*) is used by the Signal Corps as a light telephone installation and maintenance truck. It includes Reel Unit RL-46.

Truck K-50-(*) is issued in several models. One model is equipped with a commercial body and is used in the zone of interior installations. Another model is ¾-ton, 4-by-4 with open-cab and box-shaped body and is used in the theater of operations installations.

Note. TM 10-1305, TM 10-1308, TM 10-1250, and TM 10-1251.

GENERAL DATA

	K-50-A	K-50-B
CREW.....	2.....	2.....
REAR AXLES: Gear ratio.....	4.11:1.....	58.83:1.....
AXLE LOAD (lb): Loaded:		
Front.....	1,925.....	2,935.....
Rear.....	2,225.....	3,675.....
TIRES.....	Ply-6; size 6.00 x 16; pressure 40 lb.	Ply-8; size 9.00 x 16; pressure 40 lb.
GROUND CLEARANCE.....	8¼ in.....	10½ in.....

	K-50-A	K-50-B
ELECTRICAL SYSTEM:		
Voltage.....	6 v.....	6 v.....
Battery.....	1.....	1.....

CAPACITIES

	K-50-A	K-50-B
FUEL (70-octane gaso-line).....	16 gal.....	30 gal.....
COOLING SYSTEM.....	14 qt.....	17 qt.....
CRANKCASE (refill).....	5 qt.....	5 qt.....
TRANSMISSION.....	¾ qt.....	3 qt.....
DIFFERENTIAL.....	2¼ qt.....	2½ qt. ea.....
BRAKES:		
Type.....	Hydraulic.....	Hydraulic.....
Dimensions.....	1¾ in.....	1¾ in.....
TRANSMISSIONS SPEEDS.....	3.....	4.....

PERFORMANCE

	K-50-A	K-50-B
MAX. COMPUTED GRADABILITY.....	33½ percent.....	60.3 percent.....
TURNING RADIUS.....	20 ft.....	26¼ ft.....
FORDING DEPTH.....	18½ in.....	34 in.....
FUEL CONSUMPTION (loaded).....	11 mpg.....	8 mpg.....
CRUISING RANGE (loaded).....	176 mi.....	240 mi.....
ALLOWABLE SPEED.....	60 mph.....	55 mph.....
MAX. RECOMMENDED TOWED LOAD.....	None.....	1,000 lb.....

WEIGHT AND VOLUME

	K-50-A	Unpacked K-50-B
Total weight (lb).....	4,150.....	6,610.....
Total volume (cu ft).....	613.....	688.....

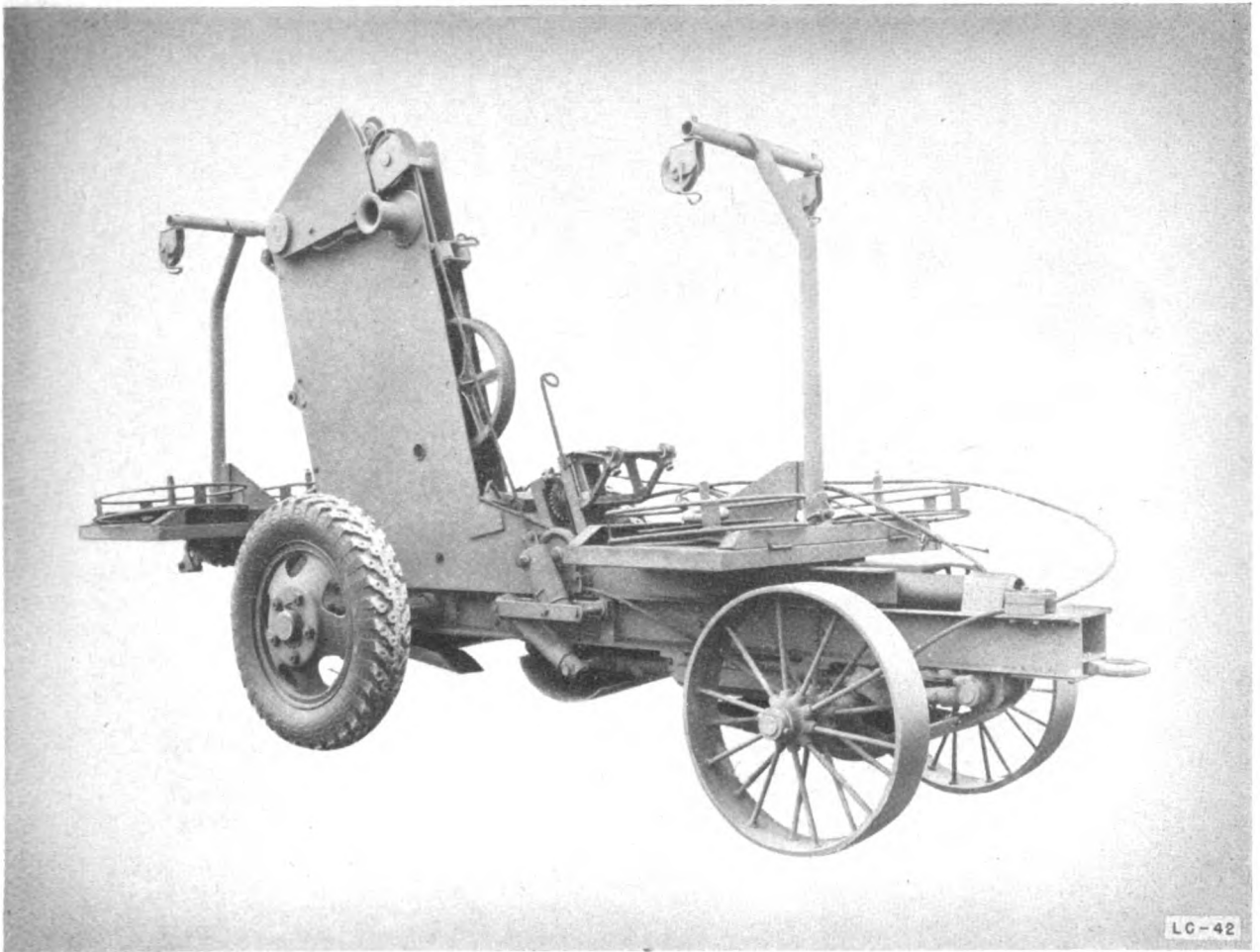


Figure 95. Plow LC-42.

Status: Limited/Std. *Reference:* TM 11-2263.

Plow LC-42 is a commercially designed plow used by the Signal Corps for burying cables over 1 inch in diameter and up to 2¼ inches in diameter. The LC-42 is designed for a max burying depth of 24 inches.

Plow LC-42 is pulled by Trailer K-37 which carries the cable reel and in turn is pulled by a

1½-ton 4-by-4 truck. The cable is fed off the reel on the Trailer K-37, through the Plow LC-42, and into the furrow in one operation.

OPERATIONAL DATA

SPEED: Approx 4 mph under normal soil conditions.
FACILITY BURIED IN ONE OPERATION: One cable up to 2¼-in. diam.

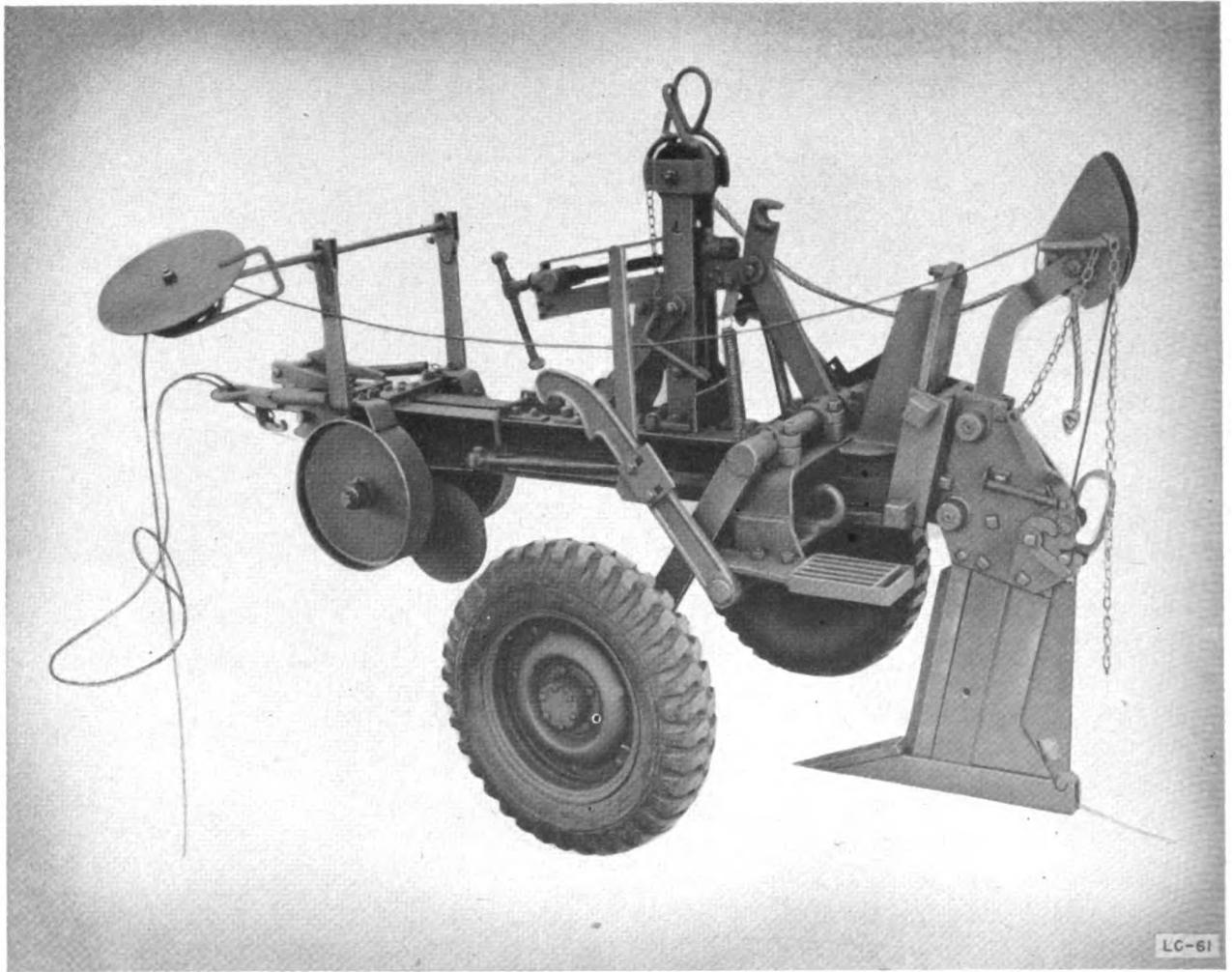


Figure 96. Plow LC-61.

Status: Standard. *Stock No.:* 6H2061. *Reference:* TM 11-370.

Plow LC-61 is a specially designed plow used by the Signal Corps for burying insulated wires or small cables to a depth of 6 to 18 inches.

Plow LC-61 is designed to be pulled by a 2½-ton truck, tractor, or winch line. It makes a furrow and lays the wires or cable in one operation. Burying can be done directly from reels mounted on the plow or after the wires or cable is on the ground and in service. The LC-61 is equipped

with Cable Recovery Device RC-548 for recovering the buried insulated wires or cable, if desired.

OPERATIONAL DATA

SPEED: Under normal conditions 5 mph.

FACILITIES BURIED IN ONE OPERATION: Two Cable WC-548, one cable 5-pr, one cable 10-pr, or six pr of field wire.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	1,525	1,815
Total volume (cu ft).....		50
Ship tons.....		1.24



Figure 97. Cable Lashing Machine LC-225/FT.

Status: Limited/Std. Stock No.: 6R194. Reference: TM 11-2263.

Cable Lashing Machine LC-225/FT is designed to lash cable to a suspension strand. It is a barrel-shaped device slotted throughout its length to permit its being placed over the suspension strands and cable. Two rubber driving units are mounted on the frame which supports the rotating unit: one at the front and one at the rear. Power for operation is derived from two grooved rubber strand wheels which ride on the strand.

Cable Lashing Machine LC-225/FT is used by Signal Corps troops when installing aerial lead-sheathed cable at permanent type installations.

OPERATIONAL DATA

LENGTH OF SPIRAL: 13 in.

TENSION OF LASHING WIRE: Approx 35 lb.

LENGTH OF CABLE LASHED IN ONE OPERATION:

Cable strand	Length (ft)
6M	315
10M	300
16M	270

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	45	56
Total volume (cu ft).....	1.6	1.8
Ship tons.....		.045



M-222

Figure 98. Converter M-222.

Status: Standard. *Stock No.:* 4F222. *Reference:* TM 11-344.

Converter M-222 is a vibrator type device which is housed in a rectangular steel box and is equipped with a handle and two removable sides. On the front panel are mounted an output receptacle, a nameplate, and a Switch SW-105.

Converter M-222 changes dc from a battery source of power into ac that can be used as ringing current for tactical telephone switchboards when other sources of ac are not available or when standard 110-volt power-ringing equipment fails in service.

TECHNICAL CHARACTERISTICS

POWER SOURCE: 3 v dc, two 1½-v Battery BA-23 connected in series.

BATTERY LIFT: Approx 8 to 10 hr under continuous operation.

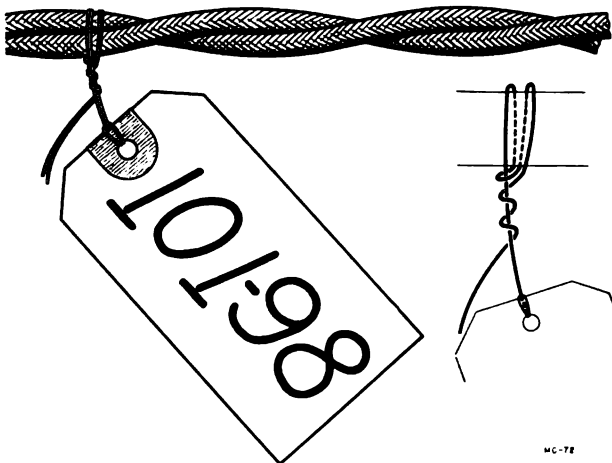
OUTPUT VOLTAGE: 100-v open circuit; 50 v with a 5-w load.

OUTPUT FREQUENCY: 24 cye ± 4 cye.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i> ¹
Total weight (lb).....	11	70
Total volume (cu ft).....	.2	2.4
Ship tons.....		.06

¹ When packed for oversea shipment and not associated with other equipment, four Converters M-222 are packed and crated together.



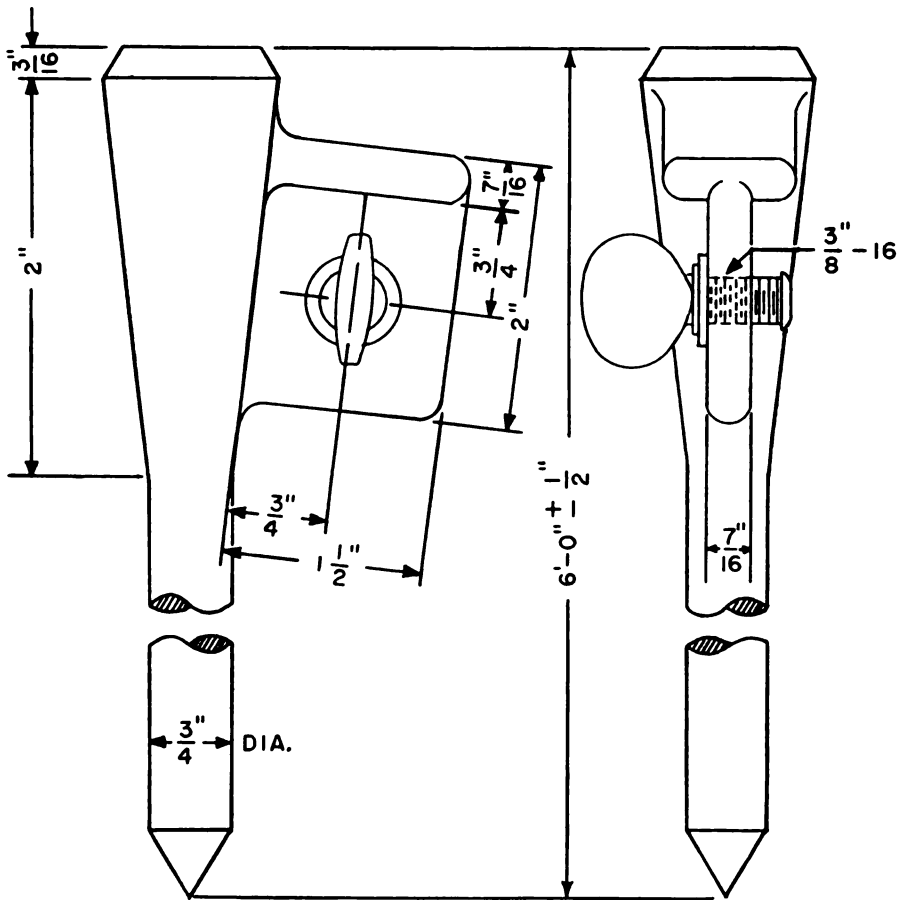
MC-72

Figure 99. Tag MC-72.

Status: Limited/Std. *Stock No.:* 4Z7272. *Reference:* FM 24-20.

Tag MC-72 is a cardboard paper identification marker 3¼ inches long and 1½ inches wide. It has a punched hole 7/16 inch from the top of the tag and midway between the sides. This hole is reinforced with a paper patch and an eyelet approximately 3/16 inch in diameter. A steel wire, #26 BWG, 12 inches long is furnished to attach the tag to field wire or cable.

Tag MC-72 is used to identify field wires or field cables in tactical communication systems.



MX-148/G

Figure 100. Ground Rod MX-148/G.

Status: Standard. Stock No.: 3Z3330-148. Reference: TM 11-676.

Ground Rod MX-148/G is a galvanized steel rod 6 feet long and $\frac{3}{4}$ inch in diameter. It is equipped with a $1\frac{1}{2}$ -inch tapered head, a cone-shaped point, and a wingnut wire connection. The wingnut wire connection is protected by a T-shaped web strong enough to protect the bolt under all conditions. In addition, the bolt has been staked so that it cannot be removed or become lost.

Ground Rod MX-148/G can be used in most cases where a suitable ground connection is necessary for the protection or proper operation of Signal Corps equipments.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	4	4
Total volume (cu ft).....	3.75	3.75
Ship tons.....		.09



Figure 101. Wire Dispenser MX-306A/G.

Status: Standard. *Stock No.:* See note below.
Reference: TM 11-2240.

Wire Dispenser MX-306A/G is an expendable, canvas and tape, drum-shaped container in which wire is wound with a pretwist so that the wire returns to a nearly straight or flat-lying position after being payed out. A nonwater-soluble adhesive is applied to the wire coils during the winding process to keep the pretwisted wire in its coiled form until ready for use and as an aid in proper payout of wire. A 24-inch standing end pigtail is available for communication during payout and to permit splicing between coils for tandem operation. Three D-rings are provided at 90° intervals around the outside periphery of the MX-306A/G. The D-rings are used in mounting the dispenser on a packboard or other types of payout fixtures.

Wire Dispenser MX-306A/G is used in the forward areas of the combat zone in the telephone

systems at platoon and company level. Wire can be laid from Wire Dispenser MX-306A/G by mountain, ski, or ground troops using a hand or shoulder sling or an Infantry packboard. Wire can be payed out by virtually any land vehicle, from an amphibious vehicle, or from a liaison-type airplane. Dispensers can be used one at a time or connected in tandem.

Note. Wire Dispenser MX-306A/G has no stock number. When Wire WD-1/TT is requisitioned under stock No. 1B190-1.4, it is issued in ½-mi. lengths in Wire Dispenser MX-306/G.

TECHNICAL CHARACTERISTICS

LENGTH OF WIRE IN DISPENSER: ½ mi. of WD-1/TT.

SPEED OF OPERATION: Approx. 100 mph max.

WEIGHT AND DIMENSIONS

WEIGHT PACKED WITH WIRE WD-1/TT: 26 lb.

Dimensions:

Outside diameter: 14½ in.

Length: 6 in.

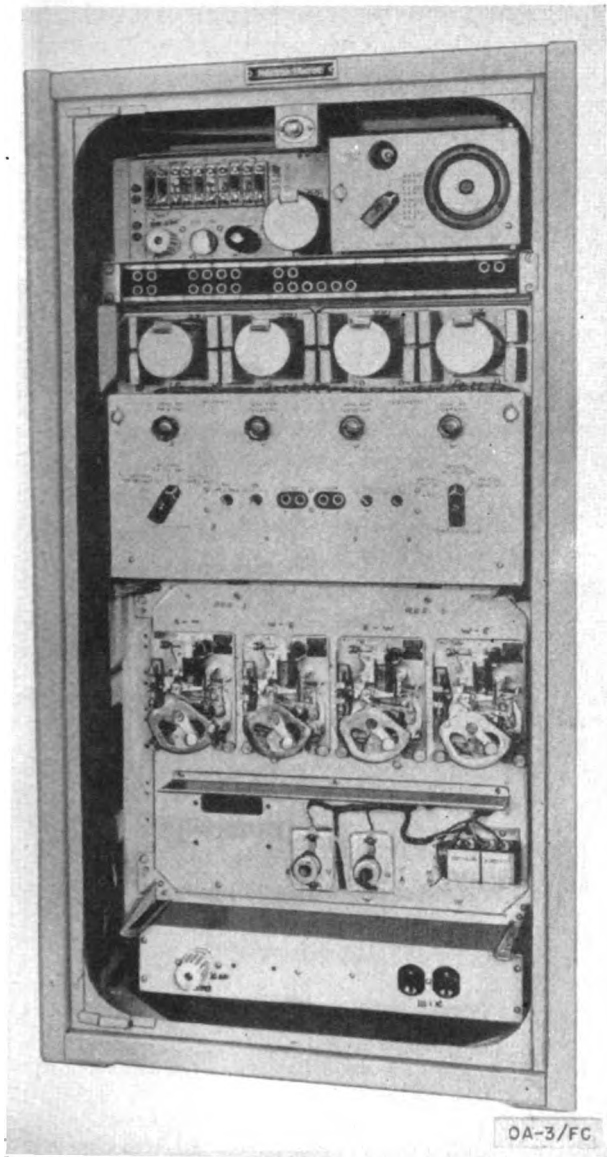


Figure 102. Regenerative Repeater OA-3/FC.

Status: Standard. Stock No.: 4A2117.

Regenerative Repeater OA-3/FC is a cabinet-inclosed unit containing two complete d-c regenerative telegraph repeaters. Each repeater consists of a relay repeating circuit and two regenerator units RED-8. The cabinet contains a

common meter panel and a patching jack circuit.

The OA-3/FC regenerates teletypewriter signals by retiming, reforming, and retransmitting start-stop, five-unit code teletypewriter signals, thereby increasing the number of line sections operable in tandem. It does not increase the length of the individual line sections. In addition to regenerating the signals, the OA-3/FC provides for another teletypewriter station on a branch circuit. Regenerative Repeaters OA-3/FC are located near and work in conjunction with Telegraph Repeater OA-6/FC. The Regenerative Repeater OA-3/FC is used with d-c telegraph repeaters or v-f telegraph terminals in long distance, fixed-plant teletypewriter systems of the communications zone in a theater of operations.

TECHNICAL CHARACTERISTICS

OPERATION:

Type: Neutral half duplex, neutral full duplex, neutral three-way.

Speed: 60 speed (368 opm) 66 speed (404 opm).

LOCATION IN SYSTEM: At an intermediate point—
Between two d-c telegraph repeaters; between two v-f telegraph terminals; between a v-f telegraph terminal and a d-c repeater.

RANGE:

Neutral to positive battery: Field wire, 20 mi.; open wire, 30 mi.

Neutral three-way: Field wire, 5 mi.; open wire, 10 mi.

POWER SUPPLY REQUIRED:

Motor circuit: 115 v, 50 to 60 cyc ac.

Transmission circuit: 130 v dc.

Alarm circuit: 6.6 v dc.

NORMAL A-C POWER CONSUMPTION: 150 w.

STAND-BY POWER: None.

TUBE COMPLEMENT: 1 ea 313CD.

PROTECTION: Fuses.

RUNNING SPARES: Tubes, fuses, relay, and lamp.

MONITORING: Monitoring printer may be connected in series with the line by plugging in at jack field.

HOUSING: Racks and panels mounted in metal cabinet.

ALARM CIRCUIT: Local fuse-alarm circuit.

TOOLS AND TEST SET REQUIRED: Test Set AN/FCM-3.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	315	450
Total volume (cu ft).....	10	23
Ship tons.....		.6

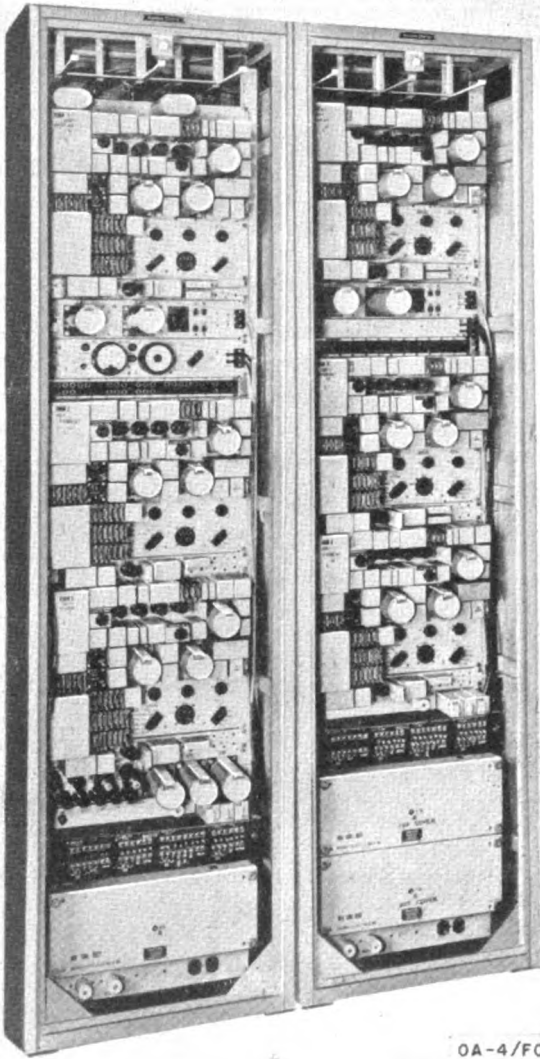


Figure 103. Carrier Terminal OA-4/FC.

Status: Limited/Std. Stock No.: 4A2794. Reference: TM 11-2029.

Carrier Terminal OA-4/FC is a 6-channel, v-f telegraph terminal made up of two bays of equipment of three channels each (channels 1 to 6). The OA-4/FC is usually used as a 6-channel, v-f carrier telegraph system or as part of a 12-channel, v-f carrier telegraph system. It uses 6 frequencies in the range from 425 to 1,275 cycles. The system provides two-way transmission. Operation is on

a 4-wire basis with separate sending and receiving paths using the same frequency for each direction of transmission. Carrier Terminal OA-4/FC is intended to be used with Carrier Terminal OA-5/FC (channels 7 through 12) to furnish 12 channels of teletypewriter communications over 1 normal telephone channel.

Carrier Terminal OA-4/FC, used separately or combined with Carrier Terminal OA-5/FC, can be operated over one channel (usually channel 2) of a 3-channel carrier telephone system using Carrier Terminal OA-11/FC or OA-12/FC. It can also be used on the v-f or the carrier channel of Carrier Terminal OA-13/FC and on any communication facility that meets the requirements of a good telephone circuit. Carrier Terminal OA-4/FC is designed to be used in long distance, fixed-plant teletypewriter systems in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normally -11 dbm.

LOCATION IN SYSTEM: At termination of telephone channel.

RANGE: Depends on the telephone facility; operable over 25-dbm net loss.

POWER SUPPLY REQUIRED: 115/230 v, 50 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 700 w.

TUBE COMPLEMENT: 30 ea 6SJ7, 6 ea 394A.

RUNNING SPARES: Tubes, fuses, and relays.

MONITORING: Monitoring panel provides facilities to monitor local side of all channels.

LEVEL INDICATION: All measurements covered.¹

HOUSING: Racks and panels mounted in metal cabinet.

CARRIED FREQUENCIES: 6 tones (425 to 1,275) spaced 170 cyc.

LINE TERMINATION: 4-wire.

LOOP TERMINATION: 2-wire or ground return.²

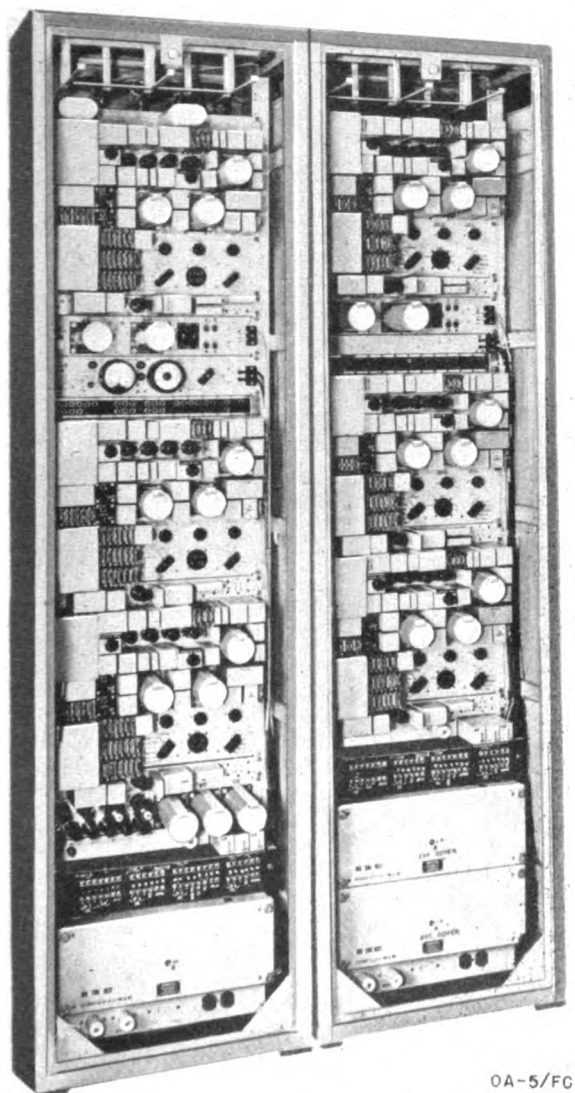
TOOL AND TEST SET REQUIRED: Test Set AN/FCM-6.

¹ Send and receive loop current, send bias, receive current, and power supply voltages.

² The following loop circuits may be accommodated: full and half duplex to either positive or negative battery; half-duplex polar or full-duplex two-path polar.

WEIGHT AND DIMENSIONS

	Unpacked	Export pack
Total weight (lb).....	1,200	1,520
Total volume (cu ft).....	42	66
Ship tons.....		1.7



OA-5/FC

Figure 104. Carrier Terminal OA-5/FC.

Status: Limited/Std. Stock No.: 4A2794.1. Reference: TM 11-2029.

Carrier Terminal OA-5/FC is a 6-channel, v-f telegraph terminal made up of two bays of equipment of three channels each (channels 7 through 12). The OA-5/FC is usually used as a 6-channel, v-f carrier telegraph system or as part of a 12-channel, v-f carrier telegraph system. It uses six frequencies in the range from 1,445 to 2,295 cycles.

The system provides two-way transmission. Operation is on a 4-wire basis with separate sending and receiving paths using the same frequency for each direction of transmission. Carrier Terminal OA-5/FC is intended to be used with Carrier Terminal OA-4/FC (channels 1 through 6) to furnish 12 channels of teletypewriter communication over 1 normal telephone channel.

Carrier Terminal OA-5/FC, used separately or combined with Carrier Terminal OA-4/FC, can be operated over one channel (usually channel 2) of a 3-channel carrier telephone system using Carrier Terminal OA-11/FC or OA-12/FC. It can also be used on the v-f or the carrier channel of Carrier Terminal OA-13/FC and on any communication facility that meets the requirements of a good telephone circuit. Carrier Terminal OA-5/FC is designed to be used in long distance, fixed-plant teletypewriter systems in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS:** Normally -11 dbm.
LOCATION IN SYSTEM: At termination of telephone channel.
RANGE: Depends on the telephone facility; operable over 25-dbm net loss.
POWER SUPPLY REQUIRED: 115/230 v, 50 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: 700 w.
TUBE COMPLEMENT: 30 ea 6SJ7, 6 ea 394A.
RUNNING SPARES: Tubes, fuses, and relays.
MONITORING: Monitoring panel provides facilities to monitor local side of all channels.
LEVEL INDICATION: All measurements covered.¹
HOUSING: Racks and panels mounted in metal cabinet.
CARRIER FREQUENCIES: 6 tones (1,445 to 2,295) spaced 170 cyc.
LINE TERMINATION: 4-wire.
LOOP TERMINATION: 2-wire or ground return.²
TOOL AND TEST SET REQUIRED: Test Set AN/FCM-6.

¹ Send and receive loop current, send bias, receive current, and power supply voltages.

² The following loop circuits may be accommodated: full and half duplex to either positive or negative battery; half-duplex polar, or full-duplex two-path polar.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	1, 200	1, 520
Total volume (cu ft).....	42	66
Ship tons.....		1. 7

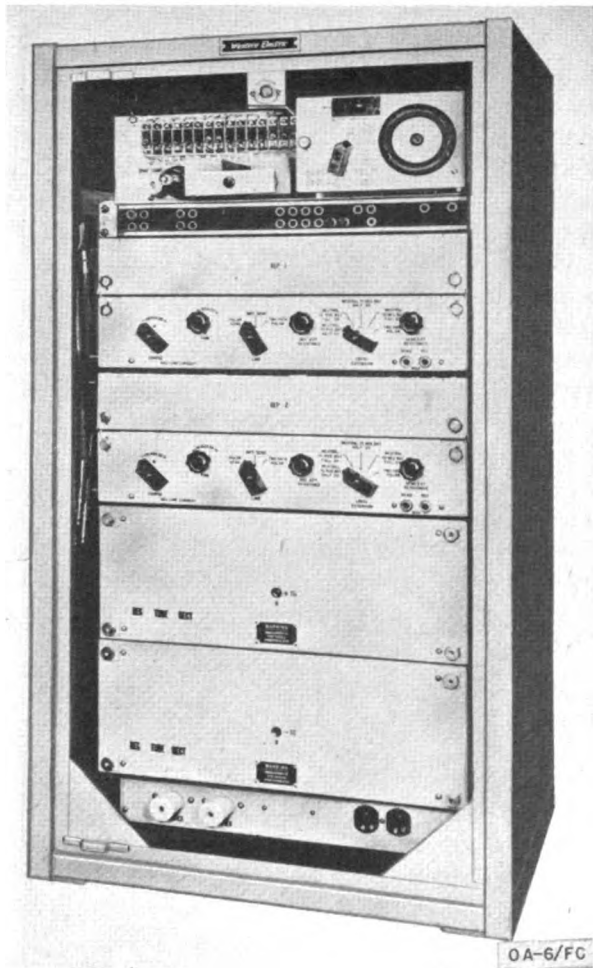


Figure 105. Telegraph Repeater OA-6/FC.

Status: Limited/Std. Stock No.: 4A2798.1 Reference: TM 11-2028.

Telegraph Repeater OA-6/FC is a cabinet-

inclosed unit consisting of two complete d-c telegraph repeaters and two rectifiers. The repeaters may be adapted to various forms of transmission on both the line and local sides. OA-6/FC may be used as a terminal repeater, intermediate repeater, and, in some instances, in conjunction with Regenerative Repeater OA-3/FC to make possible long distance telegraph systems.

Telegraph Repeater OA-6/FC is designed for use at higher headquarters or in fixed-plant communications zone teletypewriter systems.

TECHNICAL CHARACTERISTICS

OPERATION:

Line side: Polarential polar send; polarential differential send; two-path polar.

Local side: 30- or 60-ma neutral type circuit.

Speed: 60 speed (368 opm); 66 speed (404 opm).

LOCATION IN SYSTEM: At a terminal or intermediate point.

RANGE: Approx doubles the transmission range of wire facility used.

POWER SUPPLY REQUIRED: 115/230 v, 50 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 420 w.

TUBE COMPLEMENT: 4 ea 394A.

RUNNING SPARES: Tubes, fuses, and relays.

MONITORING: Monitoring printer may be connected into circuit at jack panel.

HOUSING: Racks and panels mounted in metal cabinet.

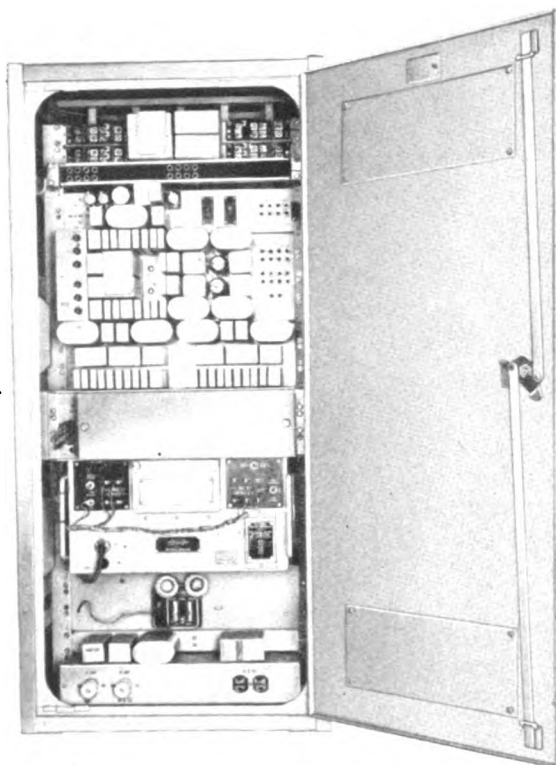
LEVEL INDICATION: Meter indicates line current and voltage of d-c power source.

LINE AND LOOP TERMINATION: 2-wire or ground return.

TOOLS AND TEST SETS REQUIRED: Test Set I-193-A; Relay Test Set I-181; volt-ohm-milliammeter.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	400	550
Total volume (cu ft).....	11	23
Ship tons.....		.6



OA-7/FC

Figure 106. Telephone Repeater OA-7/FC.

Status: Limited/Std. *Stock No.:* 4B3198.1.
Reference: TM 11-2028.

Telephone Repeater OA-7/FC is a cabinet-inclosed, v-f telephone repeater consisting of amplifying units, built-in composite sets, adjustable equalizers for 2-wire and 4-wire circuits, and adjustable networks for balancing almost any type of 2-wire line. Each unit includes a power pack for a-c operation and a bridging circuit to permit talking from a repeater to any other repeater or to the circuit terminals. In addition each cabinet contains two v-f ringers.

Telephone Repeater OA-6/FC is used to extend the range of 2- or 4-wire v-f telephone systems operated over open wire or cable facilities. The OA-7/FC is designed especially to meet the military requirements of a terminal or intermediate telephone repeater at permanent or semipermanent installations of long distance, communications zone telephone systems.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: 2-wire, max net gain 24 db;
4-wire, max net gain 30 db.

LOCATION IN SYSTEM: At termination or intermediate point of telephone channel.

RANGE: Approx 500 mi.

POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 60 w.

TUBE COMPLEMENT: 2 ea 310A, 1 ea 6V6GT/G, and 6 ea 6SJ7.

LIGHTNING PROTECTION: Carbon blocks on all lines and loop terminals.

RUNNING SPARES: Tubes, fuses, protector blocks, resistors, and capacitors.

MONITORING: Monitoring jacks.

LEVEL INDICATION: Check for singing.

HOUSING: Racks and panels mounted in metal cabinet.

FREQUENCIES: Operates in frequency band of 200 to 2,500 cyc.

LINE TERMINATIONS: 2- or 4-wire.¹

SIGNALING: V-f ringing equipment required.

TOOL AND TEST SET REQUIRED: Test Set AN/FCM-2.

¹ 2-wire termination has 600-ohm impedance 4-wire termination has 1,200-ohm impedance.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	300	440
Total volume (cu ft).....	10.7	25
Ship tons.....		.6

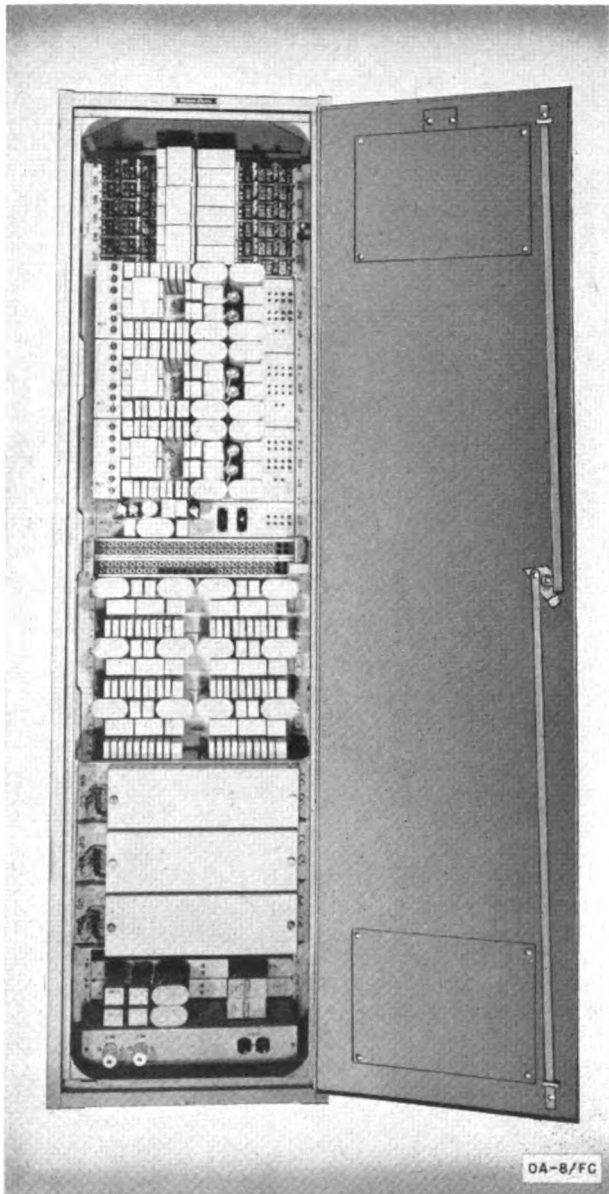


Figure 107. Telephone Repeater OA-8/FC.

Status: Limited/Std. Stock No.: 4B3199.1. Reference: TM 11-2028.

Telephone Repeater OA-8/FC is made up of three v-f telephone repeaters inclosed in one cabinet. Each repeater consists of amplifying units,

built-in composite sets, adjustable equalizers for 2- and 4-wire circuits, and adjustable networks for balancing almost any type of 2-wire line. Each unit includes a power pack for a-c operation and a bridging circuit to permit talking to any other repeater or to the circuit terminals.

Telephone Repeater OA-8/FC is used to extend the range of 2-wire or 4-wire v-f telephone systems operated over open wire or cable facilities. The OA-8/FC is designed especially to meet the military requirements of a terminal or intermediate repeater at permanent or semipermanent installations of long distance, communications zone telephone systems.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS: 2-wire, max net gain 24 db; 4-wire, max net gain 30 db.
- LOCATION IN SYSTEM: At termination or intermediate point of telephone channel.
- RANGE: Approx 500 mi.
- POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac.
- NORMAL A-C POWER CONSUMPTION: 60 w for all three repeaters.
- TUBE COMPLEMENT: 6 ea 310A, 3 ea 6V6GT/G, and 18 ea 6SJ7.
- LIGHTNING PROTECTION: Carbon blocks on all line and loop terminals.
- RUNNING SPARES: Tubes, fuses, protector blocks, resistors, and capacitors.
- MONITORING: Monitoring jacks.
- LEVEL INDICATION: Check for singing.
- HOUSING: Racks and panels mounted in metal cabinet.
- FREQUENCIES: Operates in frequency band of 200 to 2,500 cyc.
- LINE TERMINATIONS: 2- or 4-wire.¹
- SIGNALING: V-f ringing equipment required.
- TOOL AND TEST SETS REQUIRED: Test Set AN/FCM-2.
- AUXILIARY EQUIPMENT: Ringer TA-38/FC (4 circuits).

¹ 2-wire termination has a 600-ohm impedance; 4-wire termination has a 1,200-ohm impedance.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)	650	975
Total volume (cu ft)	18.3	35.5
Ship tons .....		.9

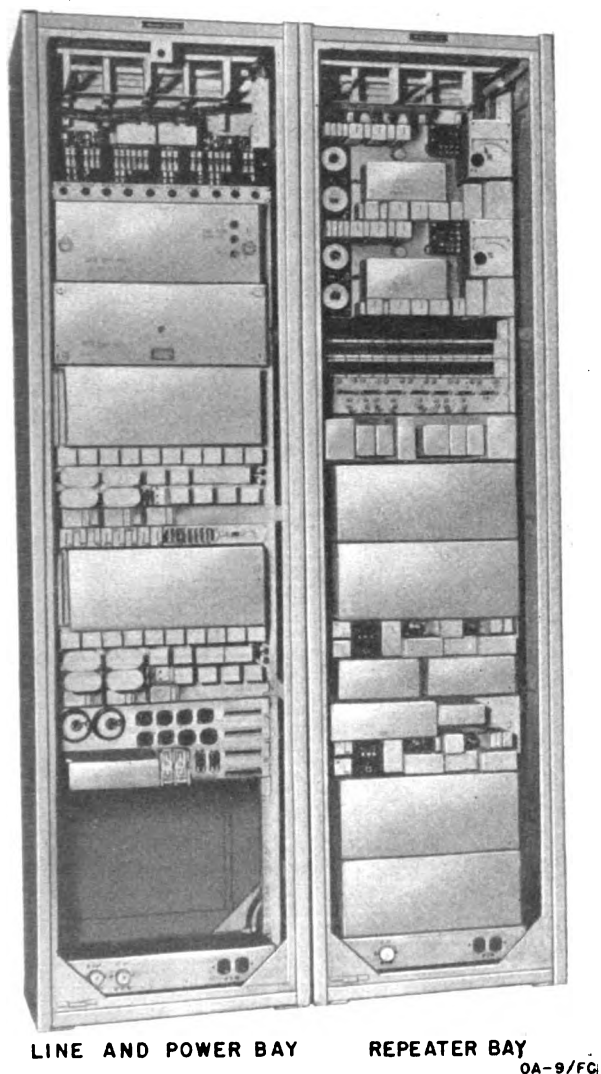


Figure 108 Carrier Repeater OA-9/FC.

Status: Limited/Std. Stock No.: 4B3202C.1.
Reference: TM 11-2026.

Carrier Repeater OA-9/FC is a 2-wire c-f repeater contained in two cabinets. One cabinet contains the amplifying and pilot channel equipment, and the other cabinet contains the line equipment and power circuits. A single cable is used to connect the two bays, one end of which

is permanently connected to terminal strips in the LINE and POWER bay. The OA-9/FC consists of amplifying units, line filters, balancing equipment, d-c composite sets, and line protection equipment. Carrier Repeater OA-9/FC amplifies simultaneously all c-f present on the physical pair of an open wire telephone circuit. It does not amplify the vf.

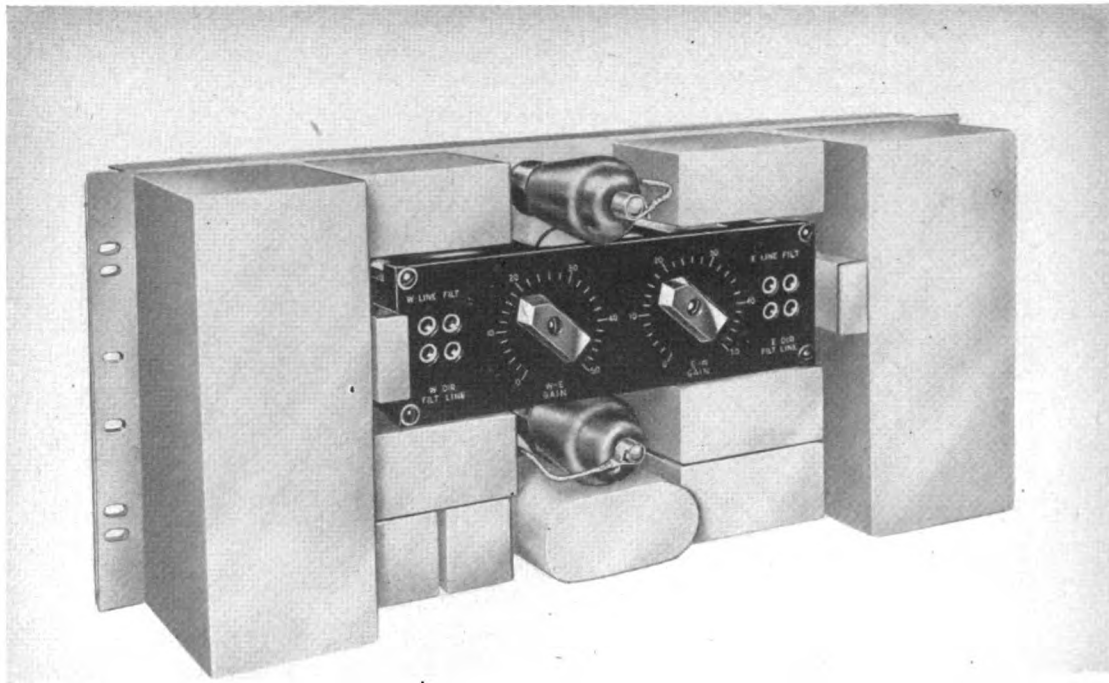
Carrier Repeater OA-9/FC is designed for use at intermediate points of multichannel carrier telephone systems that use Carrier Terminals OA-11/FC and OA-12/FC. This type of carrier system is used in long distance, fixed-plant telephone systems in a communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS: Output +18 dbm.
- LOCATION IN SYSTEM: At intermediate points of multichannel telephone system.
- RANGE: Spaced at 100- to 295-mi intervals; this depends on the characteristics of wire facility used.
- POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac 45 v dc for grid of amplifier tubes uses 6 ea Battery BA-34.
- NORMAL A-C POWER CONSUMPTION: 240 va.
- TUBE COMPLEMENT: 4 ea 310, 2 ea 311, 2 ea 394A, and 4 ea 346B.
- LIGHTNING PROTECTION: Carbon blocks at all line binding posts.
- RUNNING SPARES: Tubes, protector blocks, and fuses.
- MONITORING: None provided on repeater, physical circuit may be used.
- LEVEL INDICATION AND CONTROL: Pilot channel regulator circuit.
- HOUSING: Racks and panels mounted in two metal cabinets.
- CARRIER FREQUENCIES: Operates in frequency range of 6 to 29 kc.
- LINE TERMINATIONS: 2-wire, at approx 600-ohm impedance.
- SIGNAL AND ALARM CIRCUIT: Part of pilot channel regular circuit.
- TOOL AND TEST SET REQUIRED: Test Set AN/FCM-1.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	1,080	1,570
Total volume (cu ft)-----	42	75
Ship tons-----	-----	1.9



OA-10/FC

Figure 109. Carrier Repeater OA-10/FC.

Status: Limited/Std. Stock No.: 4B3202H.
Reference: TM 11-2025.

Carrier Repeater OA-10/FC is a single-channel carrier repeater used to extend the length of type H carrier systems that use Carrier Terminal OA-13/FC. The OA-10/FC amplifies the carrier-frequency currents that are present on the physical pair of an open wire line but does not amplify the v-f currents. If the v-f currents are to be repeated or terminated at the carrier repeater point, two Carrier Filters F-36/FC must be furnished. If the physical circuit is composited or simplexed, Line Composite Terminal OA-14/FC or Line Simplex Terminal OA-15/FC must be furnished to terminate or bypass the composite or simplex circuits around the repeater and to provide line protection. For proper operation and protection, Carrier Repeater OA-10/FC and its associated equipment should be mounted in Cabinet Telephone Apparatus CY-413/FC or CY-414/FC.

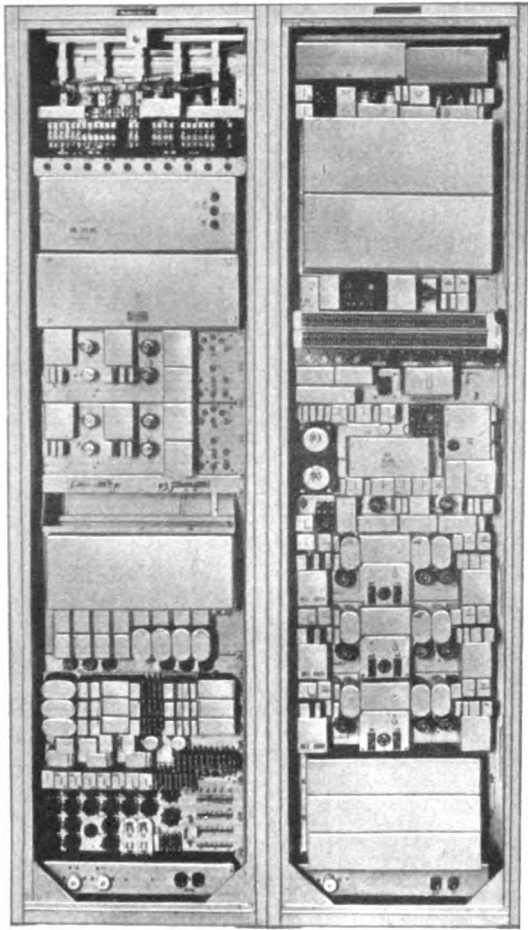
Carrier Repeater OA-10/FC is used in permanent or semipermanent, medium-length, type H carrier systems at higher echelon headquarters or in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS: +16 dbm.
- LOCATION IN SYSTEM: At intermediate points of a type H carrier system.
- RANGE: Total length of system can be from 150 to 1,135 mi; this depends on the characteristics of the wire facility used.
- POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac.
- NORMAL A-C POWER CONSUMPTION: 15 w.
- TUBE COMPLEMENT: 2 ea 310A.
- HOUSING: May be housed in Cabinet CY-412/FC or CY-414/FC.
- CARRIER FREQUENCIES: Operates in frequency range of 4 to 10 kc (upper and lower side bands of 7.15 kc).
- LINE TERMINATIONS: 2-wire, at approx 600-ohm impedance.
- TOOL AND TEST SETS REQUIRED: Test Set AN/FCM-2 and Test Set TS-190/U.
- AUXILIARY EQUIPMENT: Carrier Filter F-36/FC, Line Composite Terminal OA-14/FC, or Line Simplex Terminal OA-15/FC Cabinet CY-413/FC or CY-414/FC.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	35	70
Total volume (cu ft).....	.49	4.5
Ship tons.....		.11



LINE AND POWER BAY

TERMINAL BAY

OA-11/FC

Figure 110. Carrier Terminal OA-11/FC.

Status: Limited/Std. Stock No.: 4B8363C-1.1.
Reference: TM 11-2026.

Carrier Terminal OA-11/FC is part of a multichannel system which operates in the frequency range of 6 to 12 kc, and provides facilities for superimposing additional telephone channels on an existing open wire v-f telephone circuit. Carrier terminals are used on each end of the system and designated as east or west terminals. The OA-11/FC is an east terminal and is made up of two bays of equipment, the LINE and POWER bay and the TERMINAL bay. It is used with Carrier Terminal OA-12/FC (west terminal) and Carrier Repeater OA-9/FC to make up a multichannel telephone carrier system.

Carrier Terminal OA-11/FC provides three equivalent 4-wire circuits above v-f range and two composited telegraph legs on one open wire pair. The OA-11/FC includes modulators, demodulators, amplifiers, directional filters, balancing nets, composite sets, and line protection. Volume limiters are provided on channels 1 and 3. The OA-11/FC has automatic regulation and requires grid battery to be furnished locally.

Carrier Terminal OA-11/FC is intended for use on long distance, multichannel, carrier telephone systems operating over open wire circuits of permanent or semipermanent installations in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: +18 dbm output.

LOCATION IN SYSTEM: At termination of multichannel carrier telephone system.

RANGE: Several thousand mi.¹

POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac 45 v dc, biasing voltage for volume limiters and amplifiers.

NORMAL A-C POWER CONSUMPTION: 270 w.

TUBE COMPLEMENT: 21 ea 310, 2 ea 311, 2 ea 394A, and 3 ea 346B.

LIGHTNING PROTECTION: Carbon block protectors at all line and loop terminals.

RUNNING SPARES: Tubes, fuses, and protectors.

MONITORING: Telephone circuit and handset.

LEVEL INDICATION: By pilot channel regulator circuit.

HOUSING: Racks and panels mounted in two metal cabinets.

CARRIER FREQUENCIES:²

	CS allocation		CU allocation	
	E-W (kc)	W-E (kc)	E-W (kc)	W-E (kc)
Channel 1.....	12.9	24.4	12.9	21.4
Channel 2.....	9.4	20.7	9.4	17.7
Channel 3.....	6.3	28.4	6.3	25.4

LINE TERMINATION: 2-wire, 800-ohm impedance.

LOOP TERMINATION: 2- or 4-wire.

SIGNAL AND ALARM CIRCUIT: Pilot channel regulator circuit.

TOOL AND TEST SETS REQUIRED: Test set AN/FCM-1 and either one of the following: Tool Kit TK-41/FC, TK-42/FC, or TK-43/FC.

AUXILIARY EQUIPMENT: V-f Ringing Equipment TA-39/FC.

¹ By using intermediate repeaters, spaced approx 100 to 175 mi apart, the length of this system can be extended several thousand mi, being limited in this respect only by the transmission, noise, and crosstalk characteristics of the lines involved.

² The equipment is arranged to use either of two frequency allocations, termed CS and CU, respectively.

WEIGHT AND VOLUME

	Unpacked	Erport pack
Total weight (lb).....	1,190	1,680
Total volume (cu ft).....	12	75
Ship tons.....		1.9

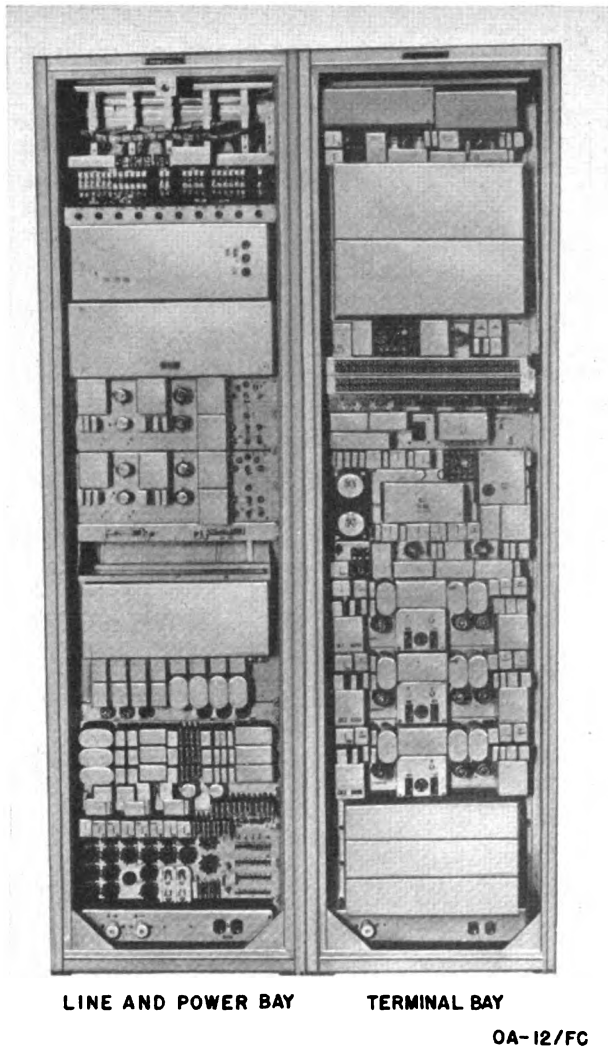


Figure 111. Carrier Terminal OA-12/FC.

Status: Limited/Std. Stock No.: 4B8363C-2.1.
Reference: TM 11-2026.

Carrier Terminal OA-12/FC is part of a multi-channel system which operates in the frequency range of 6 to 12 kc, and provides facilities for superimposing additional telephone channels on an existing open wire v-f telephone circuit. Carrier terminals are used at each end of the system and designated as west or east terminals. The OA-12/FC is a west terminal and is made up of two bays of equipment, the LINE and POWER bay and the TERMINAL bay. It is used with Carrier Terminal OA-11/FC (east terminal) and Carrier Repeater OA-9/FC to make up a multi-channel carrier telephone system.

Carrier Terminal OA-12/FC provides three equivalent 4-wire circuits above v-f range and two composited telegraph legs on one open wire pair. The OA-12/FC includes modulators, demodulators, amplifiers, directional filters, balancing nets, composite sets, and line protection. Volume limiters are provided on channels 1 and 3. The OA-12/FC has automatic regulation and requires grid battery to be furnished locally.

Carrier Terminal OA-12/FC is intended for use on long distance, multichannel, carrier telephone systems operating over open wire circuits of permanent or semipermanent installations in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS: +18 dbm output.
- LOCATION IN SYSTEM: At termination of multichannel carrier telephone system.
- RANGE: Several thousand mi.¹
- POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac, 45 v dc, biasing voltage for volume limiters and amplifiers.
- NORMAL A-C POWER CONSUMPTION: 270 w.
- TUBE COMPLEMENT: 21 ea 310, 2 ea 311, 2 ea 394A, and 3 ea 346B.
- LIGHTNING PROTECTION: Carbon blocks at all line and loop terminals.
- RUNNING SPARES: Tubes, fuses, and protectors.
- MONITORING: Telephone circuit and handset.
- LEVEL INDICATION: By pilot channel regulator circuit.
- HOUSING: Racks and panels mounted in two metal cabinets.
- CARRIER FREQUENCIES:²

	CS allocation		CU allocation	
	E-W (kc)	W-E (kc)	E-W (kc)	W-E (kc)
Channel 1-----	12.9	24.4	12.9	21.4
Channel 2-----	9.4	20.7	9.4	17.7
Channel 3-----	6.3	28.4	6.3	25.4

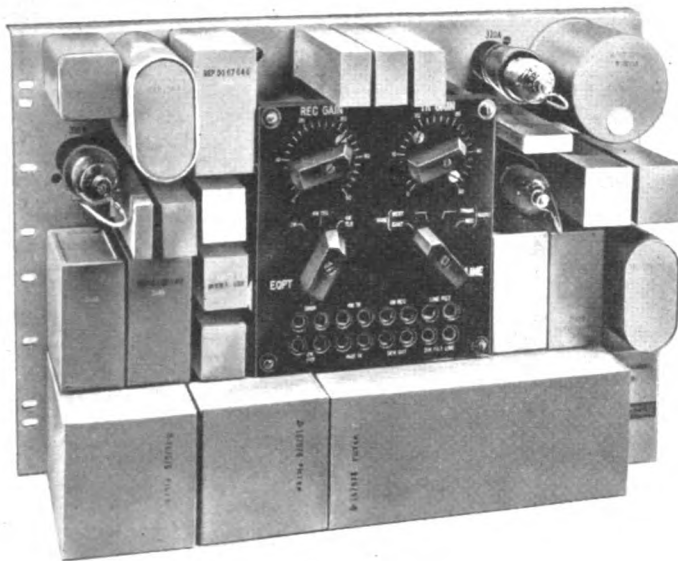
- LINE TERMINATION: 2-wire, 600-ohm impedance.
- LOOP TERMINATION: 2- or 4-wire.
- SIGNAL AND ALARM CIRCUIT: Pilot channel regulator circuit.
- TOOL AND TEST SETS REQUIRED: Test Set AN/FCM-1 and either one of the following: Tool Kit TK-41/FC, TK-42/FC, or TK-43/FC
- AUXILIARY EQUIPMENT: V-f Ringing Equipment TA-38/FC.

¹ By using intermediate repeaters, spaced approx 100 to 175 mi apart, the length of this system can be extended several thousand mi, being limited in this respect only by the transmission, noise, and crosstalk characteristics of the lines involved.

² The equipment is arranged to use either of two frequency allocations termed CS and CU, respectively.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)-----	1,190	1,680
Total volume (cu ft)-----	12	75
Ship tons-----		1.9



OA-13/FC

Figure 112. Carrier Terminal OA-13/FC.

Status: Limited/Std. *Stock No.:* 4B8375. *Reference:* TM 11-2025.

Carrier Terminal OA-13/FC is a single-channel, type H carrier terminal which operates in the frequency range of 4 to 6.9 kc. It provides facilities for superimposing 1 additional telephone channel or 1 to 11 telegraph channels on an existing open wire, physical or side circuit, v-f telephone circuit, or 2 additional telephone channels on a radio circuit. Carrier terminals must be used at each end of the system. The OA-13/FC, being the universal type, can be used at either end. It provides one equivalent 4-wire circuit above v-f range and includes modulator, demodulator, directional filters, band-pass filters, hybrid coil, oscillator, and amplifiers.

Carrier Terminal OA-13/FC is used in single section systems but the circuit length may be increased by the use of Carrier Repeater OA-10/FC (type H repeater). Corrections for transmission variations with temperature and weather are made manually, when necessary. In order to provide for line protection or termination of composited or simplexed circuits, the OA-13/FC should be used in conjunction with either a v-f terminal repeater, Line Composite Terminal OA-14/FC, or Line Simplex Terminal OA-14/FC. For equipment protection the OA-13/FC and its associated equipment should be mounted in cabinet Telephone Apparatus CY-413/FC or CY-414/FC.

Carrier Terminal OA-13/FC is intended for use on medium-length, carrier telephone systems operating over open wire circuits of permanent or semipermanent installations in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: +16 dbm output.
LOCATION IN SYSTEM: At termination of H carrier telephone system.
Range: Max of 750 mi for 6-db net loss circuit using one repeater.
POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: 20 w.
TUBE COMPLEMENT: 3 ea 310A.
RUNNING SPARES: Tubes.
HOUSING: May be housed in Cabinet CY-412/FC or CY-414/FC.
CARRIER FREQUENCIES: E-W—7.4 to 10.15 kc;
 W-E—4.15 to 6.9 kc.
LINE TERMINATION: 2-wire, 600-ohm impedance.
LOOP TERMINATION: 2- or 4-wire.
TOOL AND TEST SETS REQUIRED: Test Set AN/FCM-2 and one of the following: Tool Kit TK-41/FC, TK-42/FC, or TK-43/FC.
AUXILIARY EQUIPMENT: Carrier Filter F-36/FC; Line Composite Terminal OA-14/FC or Line Simplex Terminal OA-15/FC V-f ringing equipment.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	50	120
Total volume (cu ft).....	1.25	6
Ship tons.....		.15

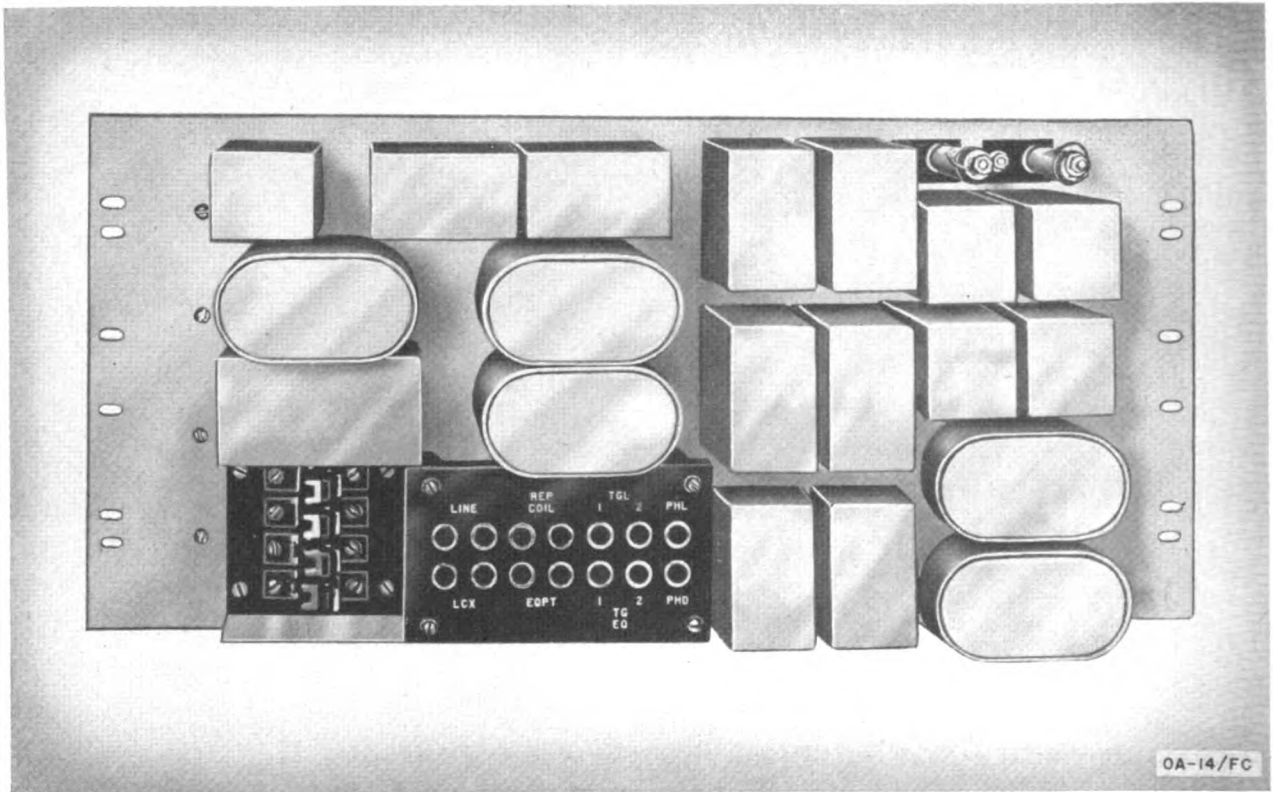


Figure 113. Line Composite Terminal OA-14/FC.

Status: Limited/Std. Stock No.: 4C1806-3.
Reference: TM 11-2031.

Line Composite Terminal OA-14/FC consists of three major parts: a protector unit, a composite set unit, and a repeating coil. The protectors are open-spaced cut-outs and serve to protect the apparatus from excessive voltages on the line, caused by lightning or other sources of high potential. A drainage coil is associated with the protectors so that momentary operation of the protectors caused by only moderately high potentials will have a minimum effect on any carrier superimposed on the line. The composite set serves to separate line currents used for telegraph from line currents used for v-f or c-f channels. Each composite set provides two telegraph legs for each physical or side circuit. The repeating coil is a 1.15 to 1 coil with balanced line windings for derivation of a phantom circuit if desired. When the OA-14/FC is used on line circuits, v-f ringing equipment must be used for signaling since the

composite set will not pass 20-cycle current.

Line Composite Terminal OA-14/FC is used to furnish line termination and protection for Carrier Terminal OA-13/FC and Carrier Repeater OA-10/FC when composite telegraph circuits are desired. It is used on open wire circuits in permanent or semipermanent installations in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

LOCATION IN SYSTEM: Line side of terminal equipment.

LIGHTNING PROTECTION: Open-spaced cut-outs (carbon blocks) and drainage coil.

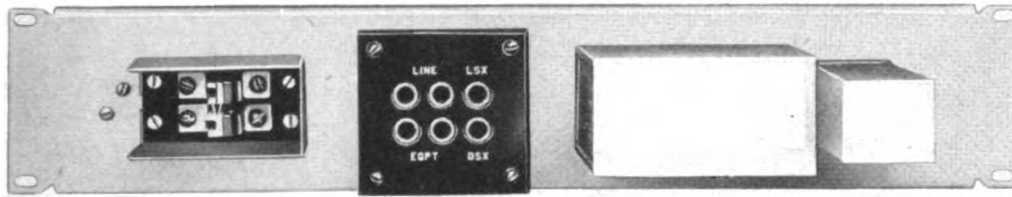
HOUSING: Should be mounted in apparatus cabinet.

LINE TERMINATIONS: 2-wire, 600-ohm impedance.

SIGNALING: V-f ringing equipment required.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	43	75
Total volume (cu ft).....	.79	3.5
Ship tons.....		.1



OA-15/FC

Figure 114. Line Simplex Terminal OA-15/FC.

Status: Limited/Std. Stock No.: 4B8460H-1.
Reference: TM 11-2020.

Line Simplex Terminal OA-15/FC is an assembly of equipment which consists of a repeating coil, a capacitor, and open-spaced cut-outs. It is designed to terminate nonrepeated v-f circuits that do not require composite operation. Protectors are provided to protect the repeating coil from excessive voltages on the line, caused by lightning or other sources of high potential. Jacks are provided so that the line or repeating coil can be tested or patched as required. Jacks are also provided in the simplex leg so that the leg or the equipment connected to the leg can be tested or patched as required. A blocking capacitor is provided at the midpoint of the drop side of the coil to prevent dc from flowing through the repeating coil. The capacitor also tends to make the repeating coil resonant at 20 cycles and thus increase the 20-cycle ringing range. The repeating coil used in the OA-15/FC is a 1 to 1 coil designed to pass frequencies in the voice range. The coil will pass both 20- and 1,000-cycle currents used for signaling purposes.

The OA-15/FC is designed to simplex or phan-

tom telephone circuits to obtain either three telephone and one telegraph channels or two telephone and two telegraph channels from existing telephone circuits. Line Simplex Terminal OA-15/FC can be used to furnish line termination and protection for Carrier Terminal OA-13/FC and Carrier Repeater OA-10/FC when simplex telegraph circuits are desired. It is used on open wire or cable circuits in permanent or semipermanent installations in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

LOCATION IN SYSTEM: Line side of terminal equipment.

LIGHTNING PROTECTION: Open-spaced cut-outs (carbon blocks).

HOUSING: Should be mounted in apparatus cabinet.

LINE TERMINATIONS: 2-wire, 600-ohm impedance.

SIGNALING: Will pass 20- or 1,000-cyc ringing currents.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	12	19
Total volume (cu ft).....	.46	.65
Ship tons.....		.045

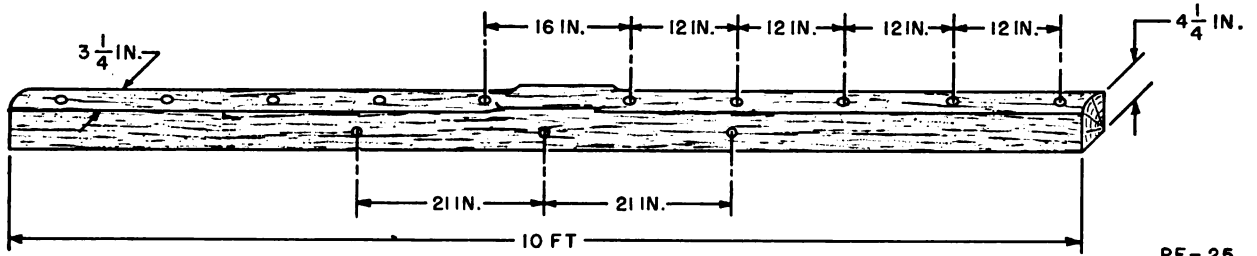


Figure 115. Crossarm PF-25.

Status: Standard. Stock No.: 5A1525. Reference: TM 11-2261.

Crossarm PF-25 is a 10-pin, creosoted southern pine cross arm. It is 10 feet long by 3 1/4 inches wide by 4 1/4 inches high. The PF-25 is bored for 1 1/4-inch diameter pins, one 5/8-inch machine bolt, and two 3/8-inch brace bolts. The pole pins are spaced 16 inches apart and the other pins are spaced 12 inches apart.

Crossarm PF-25 is designed for use on permanent or semipermanent outside plant installa-

tions at higher levels of tactical communications and in the communications zone of a theater of operations. It is intended for use on pole lines that are not, and probably never will be, used as combination telephone and power transmission lines.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	36	36
Total volume (cu ft).....	1.2	1.2
Ship tons.....		.03

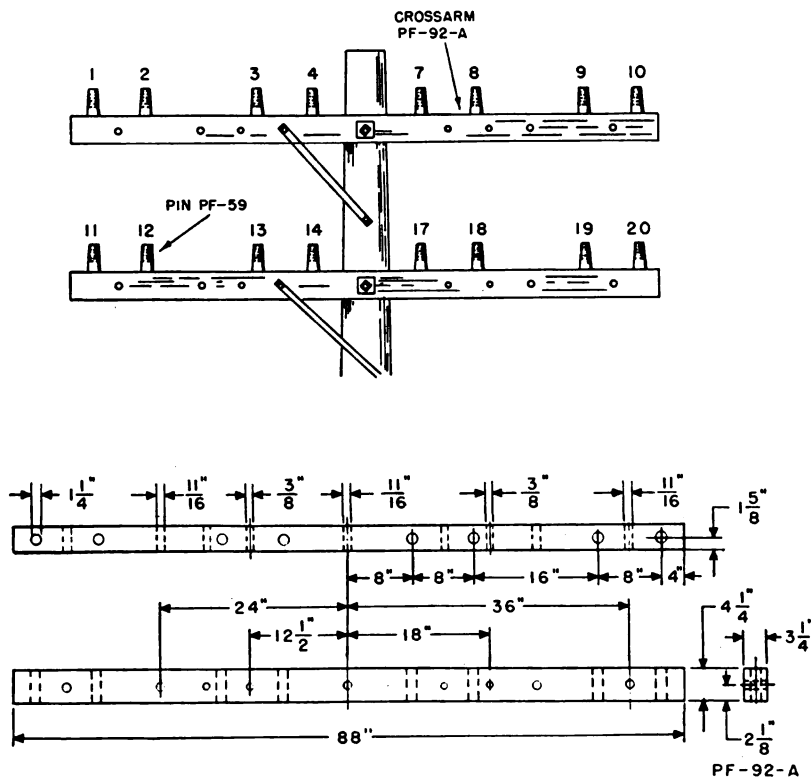


Figure 116. Crossarm PF-92-A.

Status: Standard. *Stock No.:* 5A1592A. *Reference:* TM 11-2261.

Crossarm PF-92-A is an 8-pin, creosoted southern pine crossarm. It is 7 feet 4 inches long, 3¼ inches wide, and 4¼ inches high. The PF-92-A is bored for 1¼-inch pins, five ½-inch machine bolts, and two ¾-inch brace bolts. The pins arranged in pairs are spaced 8 inches apart and each pair is spaced 12 inches apart.

Crossarm PF-92-A is designed to support eight wires, two pairs on each side of the pole. Three mounting holes are provided, one at the center and one 24 inches on each side of the center. Thus the

PF-92-A can be used with poles, X-frames, and H-fixtures. This feature also makes it possible to saw the cross arm apart at the center bolt hole to provide two 4-pin crossarms. The PF-92-A is intended for use on permanent or semipermanent outside plant installations at the higher echelons of tactical communications and in the communications zone of a theater of operations.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	26.3	26.3
Total volume (cu ft).....	.92	.92
Ship tons.....		.023

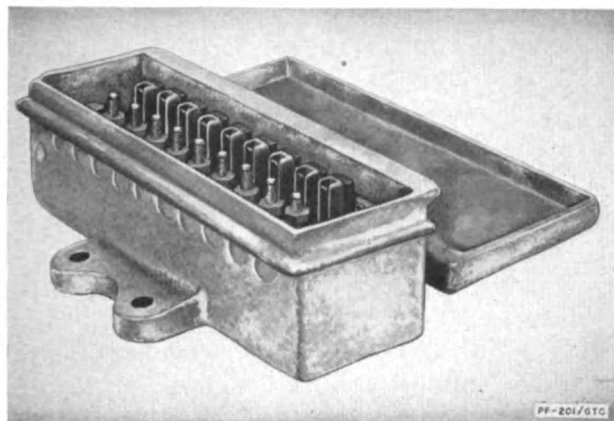


Figure 117. Protector PF-201/GTC.

Status: Standard. *Stock No.:* 5C2215-201. *Reference:* TM 11-2263.

Protector PF-201/GTC is a 5-pair terminal

strip inclosed in an iron box which is equipped with a hinged cover and is arranged for pole mounting.

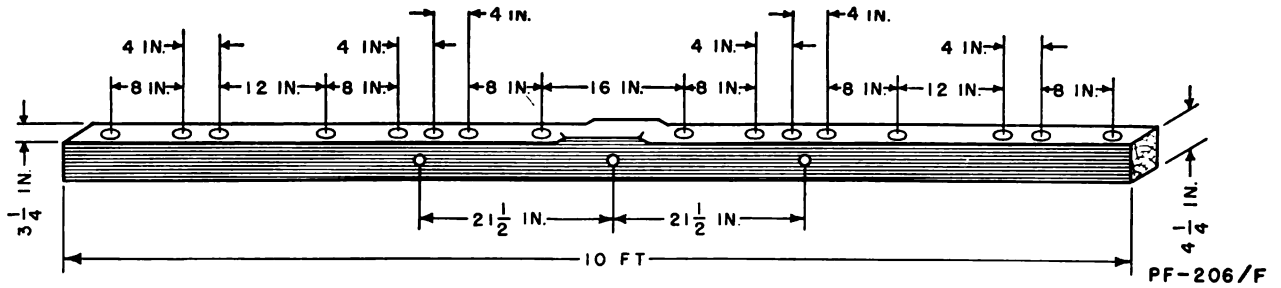
The PF-201/GTC is designed for use in protecting aerial cables, where connections are made to telephone lines, which may be exposed to highly energized foreign circuits or lightning. The PF-201/GTC is used on poles of fixed-plant telephone systems of permanent or semipermanent installations.

TECHNICAL CHARACTERISTICS

NUMBER OF PROTECTED PAIRS: 5.
TYPE OF PROTECTION: Carbon block, open-spaced cut-out.

DIMENSIONS

<i>Length (in.)</i>	<i>Width (in.)</i>	<i>Height (in.)</i>
8 1/16	15	2 3/4



Status: Standard. *Reference:* TM 11-2261.

Crossarm PF-206/F is designed to replace Crossarm PF-92-A and Crossarm PF-25. It is a creosoted southern pine, or Douglas fir, universal type cross arm 10 feet long, 3 1/4 inches wide, and 4 1/4 inches high. It is drilled for sixteen 1 1/4-inch pin locations which, when used in various combinations, provide conductor and pair spacings for either v-f, narrow band (type C) carrier, or broad band (type J) carrier telephone circuits. This cross arm will accommodate four pairs of wires spaced for carrier transmission or five pairs of wires spaced for v-f transmission.

Crossarm PF-206/F is intended for use on permanent or semipermanent outside plant installations at the higher echelons of tactical communications or in the communications zone of a theater of operations.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	36	36
Total volume (cu ft).....	1.2	1.2
Ship tons.....		.03

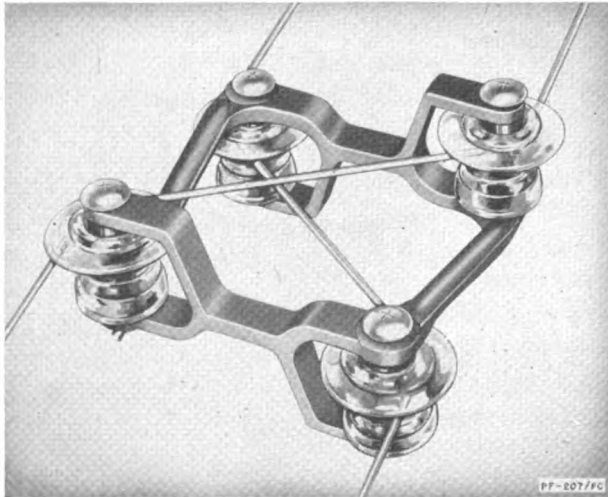


Figure 119. Transposition Bracket PF-207/FC.

Status: Standard. *Reference:* TM 11-2262.

Transposition Bracket PF-207/FC is a Dow-metal, multipoint-type bracket fitted for four roll-type glass insulators and designed for midspan transpositions on 8-inch spacing, open wire telephone lines that are intended for c-f transmission.

Transposition Bracket PF-207/FC is used to insert point-to-point transpositions into fixed-plant, open wire telephone carrier transmission lines when the transpositions must be inserted into the circuit at points other than a pole.

WEIGHT AND DIMENSIONS

<i>Weight (lb)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Depth (in.)</i>
3	5	7 1/2	8

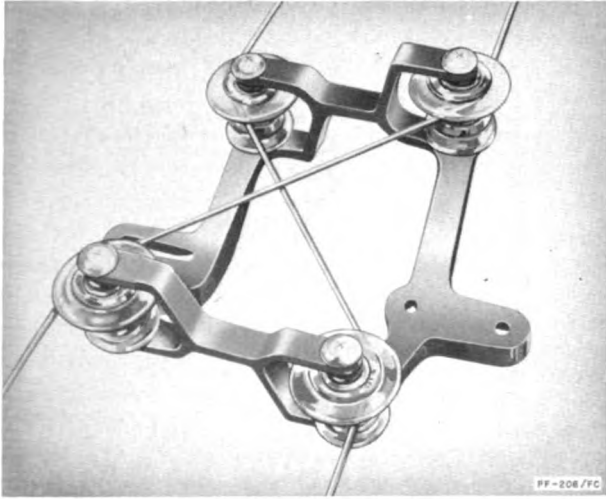


Figure 120. Transposition Bracket PF-208/FC.

Status: Standard. *Reference:* TM 11-2262.

Transposition Bracket PF-208/FC is a Dow-metal, multipoint-type bracket fitted for four insulators and designed for mounting on cross arms, of 8-inch spacing, open wire telephone lines that are intended for c-f transmission.

Transposition Bracket PF-208/FC is used to insert point-to-point transpositions into fixed-plant, open wire telephone carrier transmission lines when the transpositions can be inserted into the circuit at poles or other supports.

WEIGHT AND DIMENSIONS

<i>Weight (lb)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Depth (in.)</i>
3.5	6	7½	8



Figure 121. Facsimile Equipment RC-120.

Status: Standard. *Stock No.:* 6C25-120. *Reference:* TM 11-375B.

Facsimile Equipment RC-120-(*) represents RC-120, RC-120-A, and RC-120-B. Facsimile Equipment RC-120-(*) is a general purpose page machine which provides for the transmission and reception of printed, written, drawn, or photographic copy over regular voice communication channels. Original copy for transmission may be up to 7 inches by 8½ inches in dimensions but the

actual message or picture for transmission should not exceed 7 inches by 7¾ inches for photographic recording and 6¾ by 7¾ inches for direct recording. Transmission may be arranged for reception as a negative on film, as a positive on bromide photographic paper, or as a positive on direct recording paper (Teledeltos). The so-called transceiver unit includes a driving motor and rotating drum for carrying the record sheet or film, and it may be used for either sending or receiving purposes.

Facsimile Equipment RC-120- (*) is used at all levels of tactical communications from the division up to the higher echelons and in the communication systems of the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

OPERATING SPEED: Scans at 96 lines per in. at 90 rpm, will receive or transmit a page (7 in. by 7 3/8 in.) in 7 min.

POWER SOURCE:

Power Supply PE-140- (): Input: 100 to 130 v, 50 to 65 cyc ac.

Power Supply PE-150:

Rectifier-charger: Input: 110 v, 60 cyc ac; Output: 6 v, 5 amp.

Storage battery: Output: 6 v dc, battery drain 28 amp.

NORMAL A-C POWER CONSUMPTION: 250 w.

TUBE COMPLEMENT: 1 ea 5Z3, 1 ea 7J7, 1 ea 884, 3 ea 6AC5G, 3 ea 7N7, 5 ea 7L7, 6 ea 7C5, 2 ea R1160a, 1 ea 7C7, 1 ea 1645, and 1 ea R-1130B.

LEVEL INDICATION: Db meter.

HOUSING: Inclosed in metal case.

FREQUENCIES: Am 1,800 cps, double side band width 900 to 2,700 cps.¹

LINE TERMINATIONS: UC or KC coupling coil or directly to telephone line.

¹ For operation over radio circuits, a Converter CV-2/TX can be used with, but is not part of, the RC-120- (*). The purpose of the CV-2/TX is to transform the audio frequency s-m signal to an audio frequency f-m signal at the sending station and from audio frequency f-m signals to audio frequency a-m signals at the receiving station.

PRINCIPAL COMPONENTS

Component	Quantity		
	RC-120	RC-120-A	RC-120-B
Facsimile Transceiver FX-1-	1	0	0
Facsimile Transceiver FX-1-A.. . . .	0	1	0
Facsimile Transceiver FX-1-B.. . . .	0	0	1
Power Supply PE-140-	1	0	0
Power Supply PE-140-A-	0	1	0
Power Supply PE-140-B-	0	0	1
Power Supply PE-150-	1	0	0
Photographic Equipment PH-411-	1	1	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	207	500
Total volume (cu ft)	13	22
Ship tons . . . . .		. 55

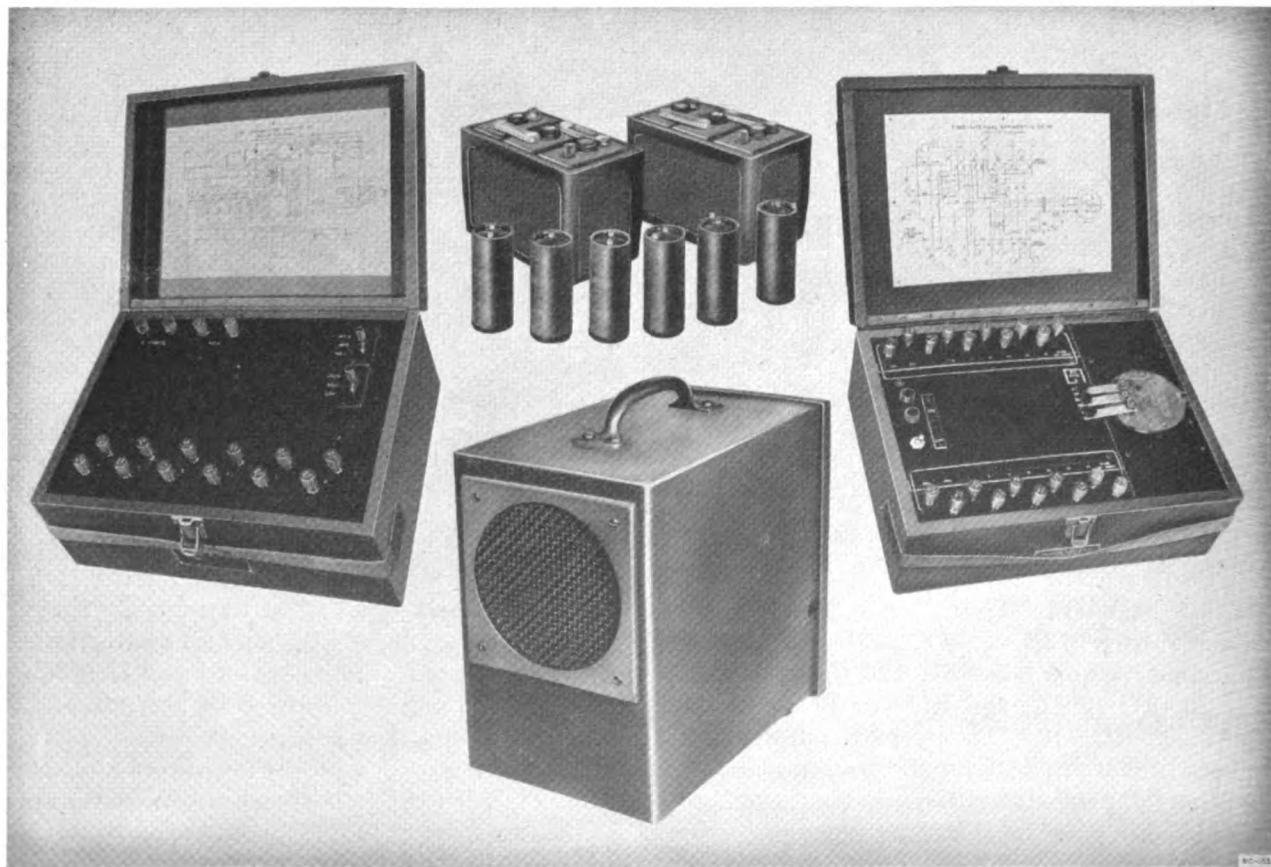


Figure 122. Time Control Equipment RC-133.

Status: Standard. Stock No.: 4H2033. Reference: TM 11-433.

Time Control Equipment RC-133 is apparatus designed to produce audible signals from a horn or to impress a signal tone on a telephone circuit at a regular and predetermined program of time intervals. The RC-133 consists basically of time interval apparatus, a line connector unit, time interval signals, and a storage battery. The RC-133 is capable of producing electrical impulses in various combinations of time intervals. By combining the time interval apparatus with the line connector unit a 1,000-cycle tone signal can be superimposed on telephone lines. The electrical impulses can also be converted to audible signals by the time interval signal located at the gun position.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 16 lines.
 LOCATION IN SYSTEM: At fire-control center of mobile artillery gun battery.
 POWER SUPPLY REQUIRED: 12 v dc, such as 2 ea Battery BB-55.
 TIME INTERVALS: 1, 5, 10, 20, 30, and 45 seconds or combinations thereof.

PRINCIPAL COMPONENTS

Component	Quantity
Time Interval Apparatus EE-85.....	1
Line Connector Unit EE-87.....	1
Time Interval Signal BE-65.....	5
Battery BB-55.....	2 in use, 2 spare

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	136	195
Total volume (cu ft).....		4
Ship tons.....		.17

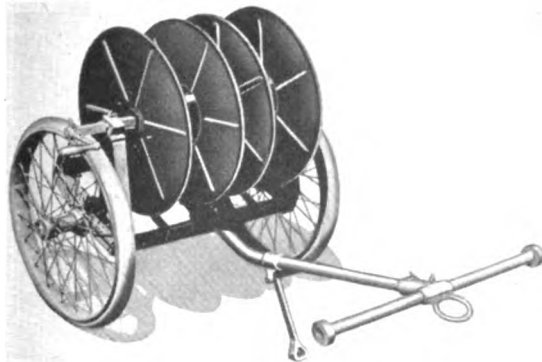


Figure 123. Reel Cart RL-16.

Status: Limited/Std. Stock No.: 6H6016.

Reel Cart RL-16 is a two-wheel, field wire-laying cart that may be pulled by hand or towed behind a slow-moving vehicle. It carries two Reels DR-4 which are removable. The axle is equipped with a detachable hand crank for recovering wire on reels. A single Reel DR-5 can be placed on the RL-16 by removing the spacer bar on the axle. The Reel Cart RL-16 may be taken apart for packing.

Reel Cart RL-16 is designed for use at the lower levels of tactical field wire systems. It is used in the laying and recovering of Field Wire W-110-B.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	175	240
Total volume (cu ft).....	10.4	25
Ship tons.....		.6

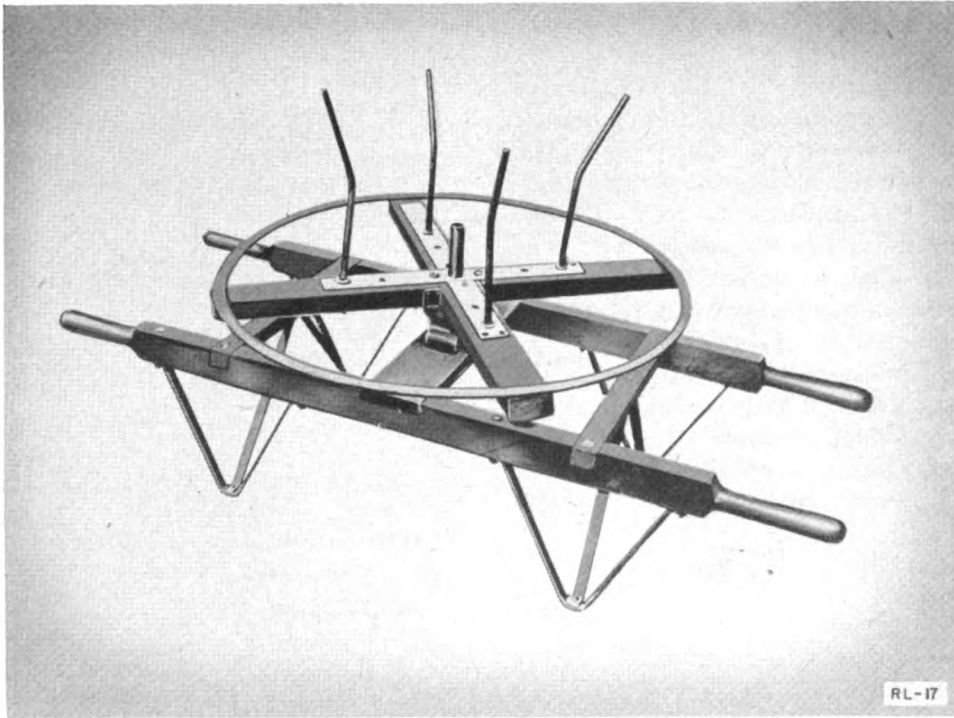


Figure 124. Reel Unit RL-17.

Status: Standard. *Stock No.:* 6H3017B (RL-17-B) and 6H3017C (RL-17-C).

Reel Unit RL-17-(*) represents RL-17-B and RL-17-C. Reel Unit RL-17-(*) is a payout reel unit consisting of a hoop assembly, a barrow assembly which is 6 feet long, 24 inches wide, and has a 42-inch diameter, and a plate shield assembly. The hoop assembly is equipped with four guard pins that can be adjusted to hold coils of wire 12, 18, and 24 inches in diameter. The barrow assembly is an H-formed frame made of hardwood. It is the carrying type and can be carried by two men. The shield assembly, provided with model RL-17-B only, consists of gal-

vanized steel plates that can be fitted on the guard pins to prevent tangling. On model RL-17-C the guard pins are complete with individual guard shields.

Reel Unit RL-17-(*) is used for pulling in or recovering wire in the construction of open wire pole lines in the communication zone of a theater of operations and for paying out open wire.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	80	93
Total volume (cu ft).....		3.7
Ship tons.....		.09

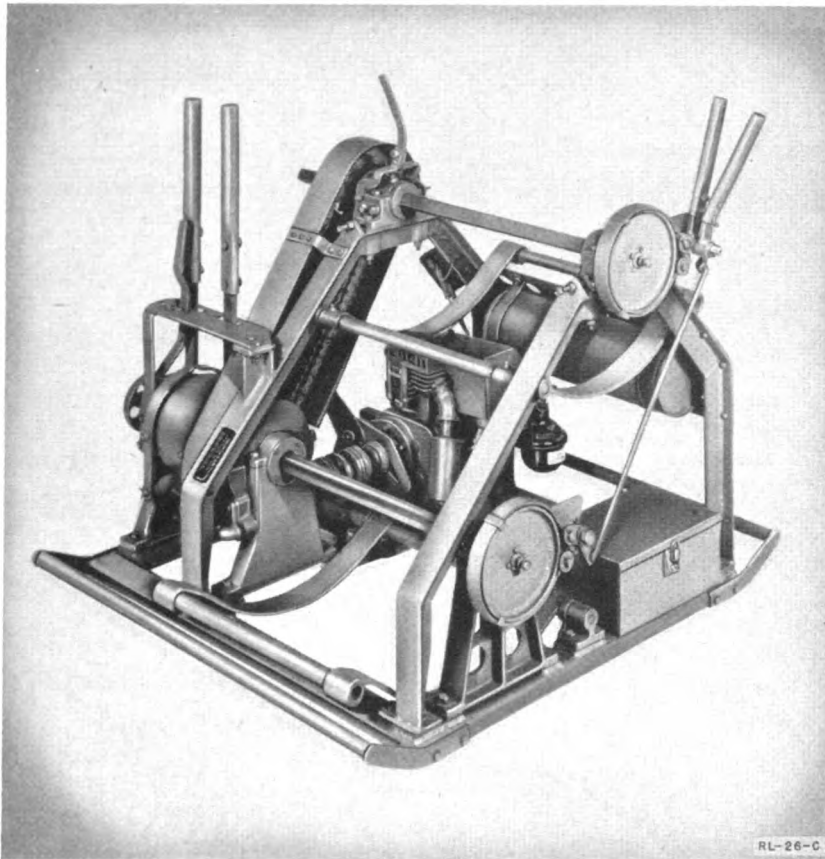


Figure 125. Reel Unit RL-26-C.

Status: Standard. *Stock No.:* 6H6226. *Reference:* TM 11-360.

Reel Unit RL-26-(*) represents RL-26, RL-26-A, RL-26-B, RL-26-C, and RL-26-E. Reel Unit RL-26-(*) is a transportable wire-laying and wire-recovering machine intended for temporary or permanent installation in motor vehicles. Reel Unit RL-26-(*) may be operated while the vehicle is stationary or in motion. The unit also may be operated dismounted in temporary stationary positions on the ground. All component parts are assembled on a skid frame which can be installed quickly in the back of a vehicle. The capacity of the unit is two Reels DR-5, or two Reels DR-15, mounted in position for paying out or reeling in the wire. The individual reels are readily replaceable. The wire can be payed out from either reel singly or from both simultaneously. Means are provided for braking the reels to prevent overspinning. The small gasoline engine provides power to recover the wire on either reel

individually or on both reels simultaneously. When the engine is inoperative, wire can be recovered by hand cranking.

Reel Unit RL-26-(*) is used to lay or recover wire in the higher levels of a Division field wire system.

TECHNICAL CHARACTERISTICS

SPEED, MAX:

Wire laying: 30 mph.¹

Wire recovering: 6 mph.

MOTOR FUEL: Regular motor vehicle gasoline.

CRANKCASE LUBRICATION: Automobile transmission lubricant SAE 80 or SAE 90; this depends on the temperature.

TOOLS: Tool assembly provided.

¹ Reinforcing kit must be used to lay wire at this speed.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (ib).....	435	925
Total volume (cu ft).....	30.8	56
Ship tons.....		1.25

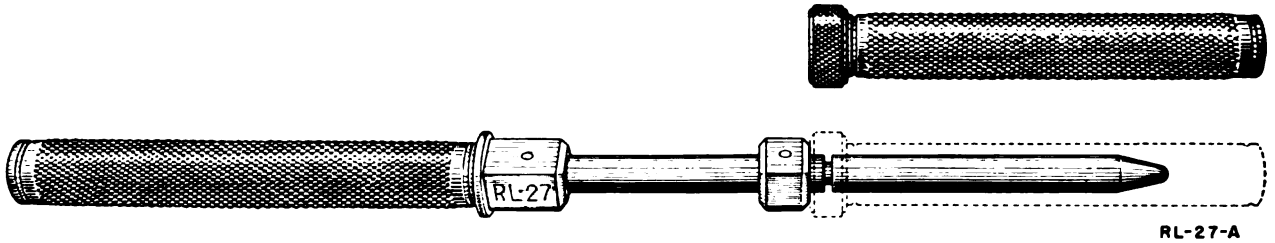


Figure 126. Axle RL-27-A.

Status: Standard. *Stock No.:* 6H227. *Reference:* FM 24-20.

Axle RL-27-(*) represents RL-27-A and RL-27-B. Axle RL-27-(*) is a simple form of a wire-laying device for laying short field wire circuits by hand. It is a machine-steel bar, about 2 feet long, with two knurled handles; one handle is permanently fixed to the bar, but the other handle can be removed to permit placing Reel DR-4 on the axle. The RL-27-A is equipped with roller bearings. Axle RL-27-B is a later model and is equipped with a crank which is used to reel in the wire.

Axle RL-27-(*) is designed for laying Wire W-110-B or other field wire from Reel DR-4 when conditions do not permit the use of other wire-laying equipment. It is used at command posts for laying short locals and also at lower levels of field wire telephone systems in the combat zone.

WEIGHT AND VOLUME

	Unpacked		Export pack	
	RL-27-A	RL-27-B	RL-27-A	RL-27-B
Total weight (lb).....	5	7	6	10
Total volume (cu ft).....			.05	.3

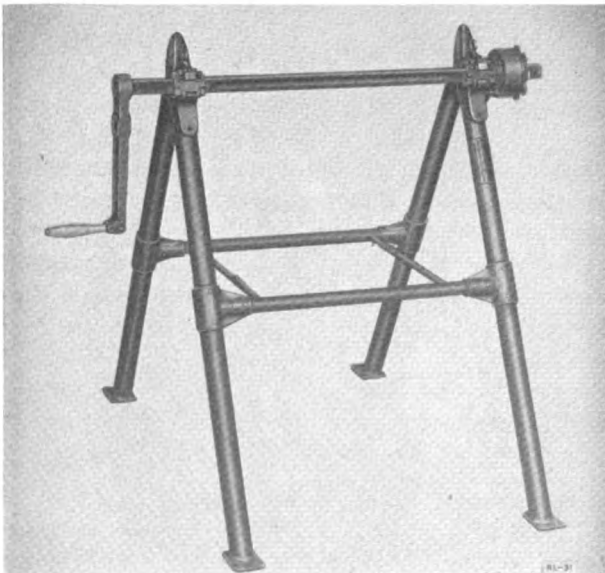


Figure 127. Reel Unit RL-31.

Status: Standard. *Stock No.:* 6H6231. *Reference:* TM 11-362.

Reel Unit RL-31-(*) represents RL-31, RL-31-A, RL-31-B, and RL-31-C. Reel Unit RL-31-(*) is a rugged, lightweight, portable unit designed to facilitate paying out and recovering,

by hand, field wire or field cable on Reels DR-4, DR-5, DR-7, and DR-15. The RL-31-(*) consists essentially of a collapsible frame of steel tubing, an axle of cold-rolled steel, a braking unit (CG-10-(*)), a crank (CG-4-A), two hangers, and four toe plates. Newer models are equipped with an installation kit for mounting a reel unit on a ¼-ton truck.

Reel Unit RL-31-(*) is intended for use at all levels of tactical field wire systems where a reel unit of the capabilities of Reel Unit RL-31-(*) is required.

PRINCIPAL COMPONENTS

Component	Quantity		
	RL-31-A	RL-31-B	RL-31-C
Frame.....	1	1	1
Axle.....	1	1	1
Crank.....	1	1	1
Brake Unit CG-10.....	1	0	0
Brake Unit CG-10-A.....	0	1	1
Strap ST-19-A.....	2	2	2
Toe clamps.....	4	4	4
Installation kit.....	0	0	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	78	145
Total volume (cu ft).....	.02	5.25
Ship tons.....		.13

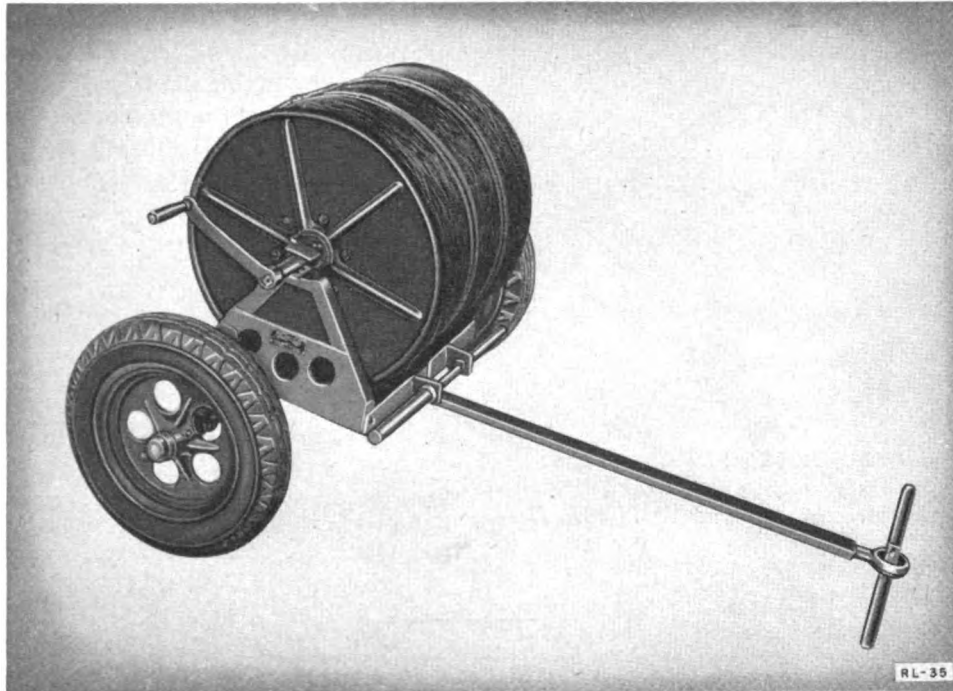


Figure 128. Reel Cart RL-35.

Status: Standard. *Stock No.:* 6H6235 (RL-35) and 6H6235A (RL-35-A). *Reference:* FM 24-20.

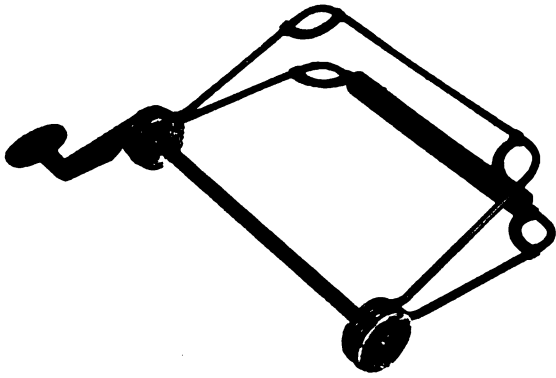
Reel Cart RL-35-(*) represents RL-35 and RL-35-A. Reel Cart RL-35-(*) is a two-wheel cart, with pneumatic tires, designed as a wire-laying and recovery cart that can be towed by hand when loaded and by truck when not loaded. Each cart carries three Reels DR-4, one Reel DR-15, or one Reel DR-5, which are removable. The axle is equipped with a detachable hand crank for use when recovering wire on the reels. Reel Cart RL-35-A is identical with Reel Cart RL-35 except for the addition of a multiple-disk-type brake which is used to adjust the tension on wire

that is being payed out. The cart is also equipped with an Axle RL-27 which may be used to carry Reel DR-4.

Reel Cart RL-35-(*) is particularly suitable for laying wire over terrain, such as soft ground or heavily wooded areas, that is impassable to motor vehicles. Reel Cart RL-35-(*) is used for laying field wire or field cable in the higher levels of a Division field wire system.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	105	280
Total volume (cu ft).....		24
Ship tons.....		.6



RL-39

Figure 129. Reel Unit RL-39.

Status: Standard. Stock No.: 6H3039. Reference: TM 11-2250.

Reel Unit RL-39-(*) represents RL-39, RL-39-A, and RL-39-B. Reel Unit RL-39-(*) is a portable wire-laying device used for laying assault wire. It will hold approximately ¼ mile of Wire WD-1/TT. The RL-39-(*) consists of a Spool DR-8, handle assembly, axle and crank assembly, and carrying straps. The Reel Unit RL-39-(*) is a component of Signal Corps Reel Equipment CE-11.

Reel Unit RL-39-(*) is designed for use in forward combat areas where it is impractical to use other types of wire-laying equipment.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	1.5	5.75
Total volume (cu ft).....		1
Ship tons.....		.025



Figure 130. Telegraph Switchboard SB-6/GG.

Status: Standard. Stock No.: 4A2593-6. Reference: TM 11-2035.

Telegraph Switchboard SB-6/GG is a wall-type, telegraph circuit patching cabinet. It consists of a phenolic jack panel inclosed in a metal cabinet, and it contains termination for four teletypewriter circuits and four miscellaneous equipment circuits. The basic unit of the SB-6/GG is a set of three jacks designated LPG 1, LPG 2, and SET. Located just below each basic unit is one miscellaneous equipment jack. Teletypewriter equip-

ment may be permanently connected to the SET jacks, line is connected to LPG 1 and LPG 2 jacks, and spare teletypewriter equipment or test equipment may be connected to the miscellaneous jacks.

The purpose of the SB-6/GG is to provide emergency switching, test point, and permanent interconnection of teletypewriter circuits in fixed or semifixed plant teletypewriter systems; at the same time it provides patching-cord facilities for temporary rerouting of teletypewriter circuits within the system.

The SB-6/GG is used in teletypewriter systems at the higher tactical levels and in the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 4.

LOCATION IN SYSTEM: Between long line equipment and teletypewriter sets or telegraph Switchboard BD-100.

HOUSING: Panel mounted in wooden cabinet.

TOOLS REQUIRED FOR MAINTENANCE: Contact burnisher holder WECO 373C; Contact burnisher blade WECO 374A; Duck-billed pliers Gage WECO 70J.

PRINCIPAL COMPONENTS

Component	Quantity
Telegraph Switchboard SB-6/GG.....	1
Cords, CO-144.....	2
Plug, dummy, WECO 165C.....	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (1 lb).....	4	8
Total volume (cu ft).....	.1	.25

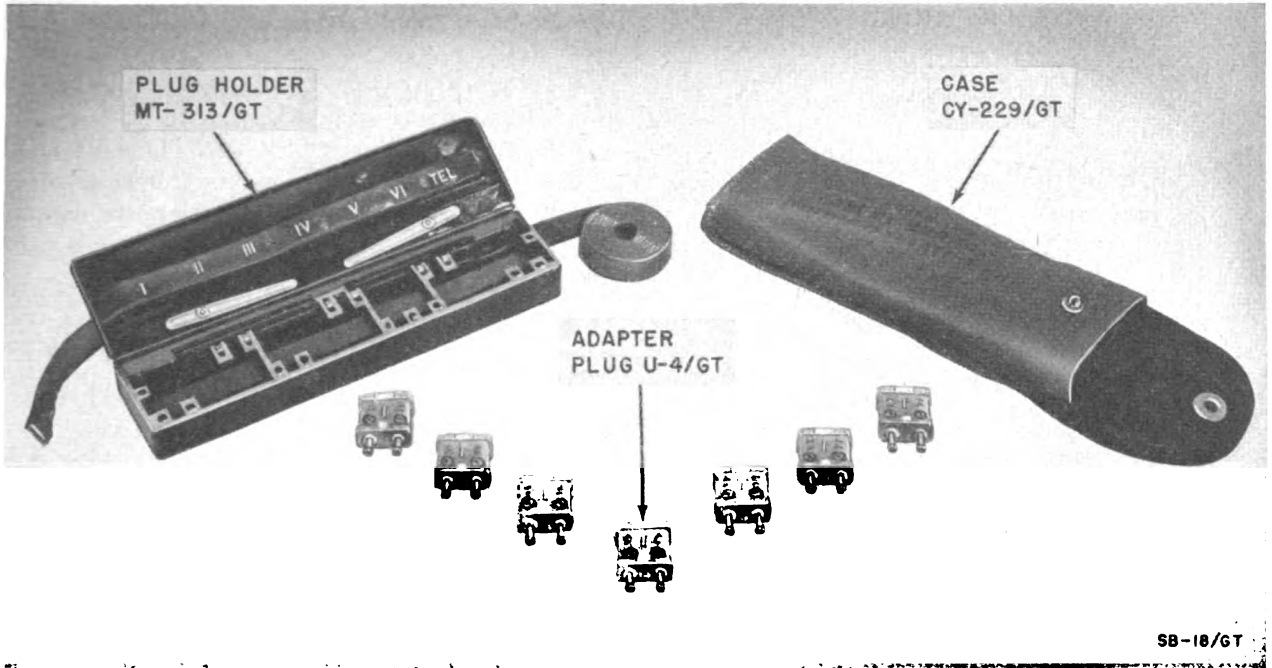


Figure 131. Emergency Switchboard SB-18/GT.

Status: Standard. Stock No.: 4C9905-18.
Reference: FM 24-20.

Emergency Switchboard SB-18/GT is a very light, highly mobile, emergency switching center for local battery telephone lines. With Telephone EE-8-(*) or Telephone TP-3-(*) for an operator's set, Emergency Switchboard SB-18/GT may serve as an emergency field replacement for a magneto switchboard. The SB-18/GT is capable of handling six local battery telephone lines. It requires the use of a local battery or sound-powered telephone as an operator's set. The local battery or sound-powered telephone is not issued as part of Emergency Switchboard SB-18/GT.

Because of the small size, weight, and moisture-proofed characteristics of the SB-18/GT, its use is suggested in jungle, mountain, amphibious, and airborne operations.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 6.

WORKING LIMITS:

No repeat coils: 3,000 ohms.

With repeat coils: 2,000 ohms.

Min insulation resistance: 1,000 ohms.

Transmission losses at 1,000 cyc:

Magneto line to magneto line: .5 db.

Added losses for ea repeat coil in circuit: .7 db.

Losses due to operator's set: 3 db.

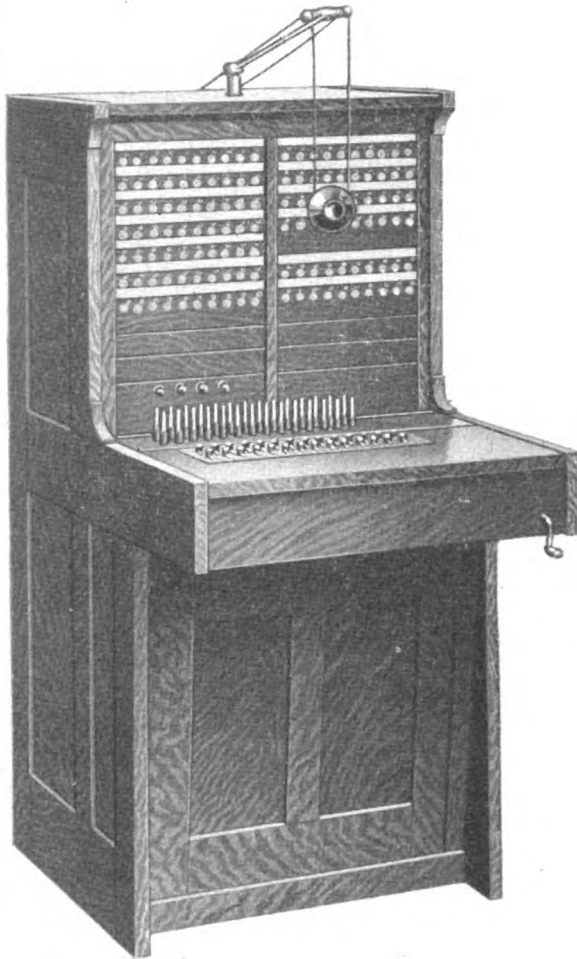
AUXILIARY EQUIPMENT: 1 ea Telephone EE-8-(*) or Telephone TP-3-(*).

PRINCIPAL COMPONENTS

Component	Quantity
Case CY-229/GT.....	1
Plug Holder MT-313/GT.....	1
Adapter Plug U-4/GT.....	7

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	2.25	5
Total volume (cu ft).....	.026	.2



SB-53/FTC

Figure 132. Telephone Switchboard SB-53/FTC.

Status: Standard. Stock No.: 4C18100-2. Reference: TM 11-2087.

Telephone Switchboard SB-53/FTC is a two-panel, single-position, manually operated, non-multiple, common battery telephone switchboard. The SB-53/FTC is inclosed in an oakwood cabinet with a removable rear cover. It is floor-mounted and equipped with common battery line circuits, common battery or dial trunk circuits, a night-alarm circuit, and a fuse-alarm circuit. The cord

circuits provide only one lamp supervision on calls from local lines to the trunks. The SB-53/FTC is not designed to connect one trunk to another for through-switching purposes.

Telephone Switchboard SB-53/FTC is intended for use in fixed-plant telephone systems, of small permanent or semipermanent depots, posts, camps, or stations, where the switching of through calls is not required.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Dial: In operator's circuit.
- Common battery line circuits: 100.
- Common battery or dial trunks: 10.
- Cord circuits: 15.
- Type of cord circuit: Universal.
- Power and heating circuit: 1.
- Ringing: Front and rear cords.
- Emergency ringing (hand generator): 1.
- Night-alarm circuit: 1.
- Fuse-alarm circuit: 1.
- Battery and ground circuit: 1.
- Power supply required: 24 v dc, 11 cells.
- Distributing frame: Floor type not furnished.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To common battery telephone.	125	10,000.
To common battery or dial trunks.	Limits of distant office controlling.	Limits of distant office controlling.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Common battery line to common battery line: .8 db.
 - Common battery line to common battery or dial trunk: .5 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: 2 db.
 - Operated: 3.5 db.
 - Monitoring key:
 - Operated: 3 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	500	700
Total volume (cu ft).....	24	40
Ship tons.....		1

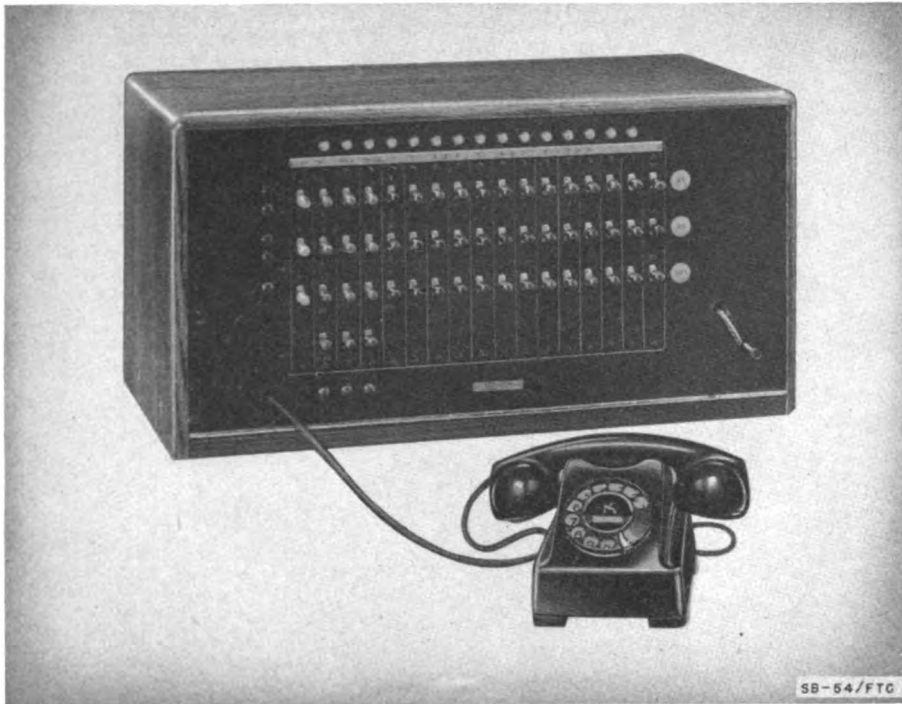


Figure 133. Telephone Switchboard SB-54/FTC.

Status: Standard. *Stock No.:* 4C11007.

Telephone Switchboard SB-54/FTC is a single-position, manually operated, nonmultiple, common battery telephone switchboard of the cordless type. All connections are set up by key operation. A connection from one loop to another or from a loop to a trunk circuit is established by operating the associated keys to the same connecting circuit. The SB-54/FTC is inclosed in a wooden cabinet and is intended to be desk-mounted. The SB-54/FTC is equipped with common battery line circuits, common battery trunks, and connecting circuits. This switchboard is not designed for connecting one trunk to another for through-switching purposes.

Telephone Switchboard SB-54/FTC is intended for use in fixed-plant telephone systems of small headquarters of permanent or semipermanent installations, where the switching of through calls is not required. It can be used to provide intercommunication and access to a limited number of trunks to a larger central office.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Dial circuit: On operator's telephone.
- Common battery line circuits: 12.

- Common battery trunks: 5.
- Connecting circuits: 5.
- Ringing: Hand generator.
- Night-alarm circuit: 1.
- Battery and ground circuit: 1.
- Power supply required: 24-30 v dc.
- Auxiliary equipment: Common battery telephone with dial if required.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To common battery telephone.	750	10,000.
To common battery trunk.	Working limit of distant office less 300 ohms.	Working limit of distant office less 300 ohms.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Common battery line to common battery line: .3 db.
 - Common battery line to common battery trunk: 1 db.
- (2) Added losses due to operator's circuit bridge:
 - Operator's key:
 - Operated: 3 db.
 - Normal: 1.5 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	110	200
Total volume (cu ft).....	24	40
Ship tons.....		1

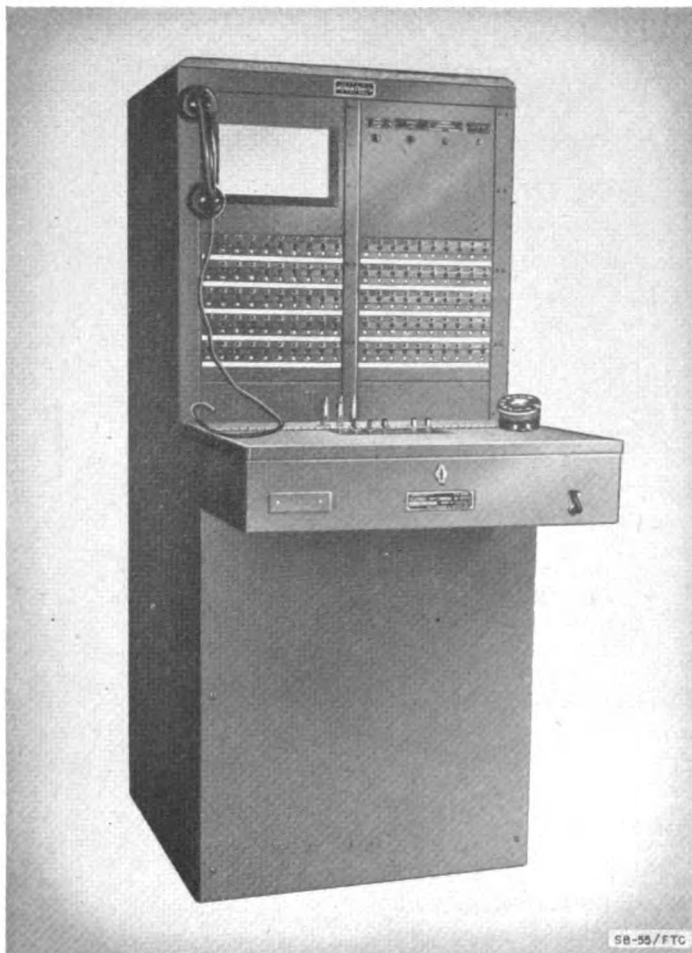


Figure 134. Telephone Switchboard SB-55/FTC.

Status: Standard. *Stock No.:* 4C17050. *Reference:* TM 11-2084.

Telephone Switchboard SB-55/FTC (Fire Reporting) is a nonmultiple, single-position, common battery, manually operated switchboard. It is contained in a wooden cabinet approximately 39 inches long by 24 inches wide by 58 inches high.

Telephone Switchboard SB-55/FTC is used in the fire-reporting telephone systems of permanent installations in the base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Common battery manual line circuits: 100.
- Trunk circuits, dial, and common battery manual: 2.
- Cord circuits: 3.
- Night-alarm circuit: 1.
- Line-out alarm circuit: 2.
- Operator's circuit: 1.

Alarm and ringing circuit: 1.

Power-failure alarm circuit: 1.

Power supply required: 48 v dc.

Tools required: Tool set furnished with switchboard.

b. WORKING LIMITS:

Loop: 700 ohms max.

Trunk: Working limits of distant office controlling.

c. EQUIPMENT REQUIRED BUT NOT SUPPLIED WITH SWITCHBOARD SB-55/FTC:

Battery BB-232/FTC: 2.

Rectifier Battery Charger PP-255/FT: 1.

Annunciator ID-214/FT: 1.

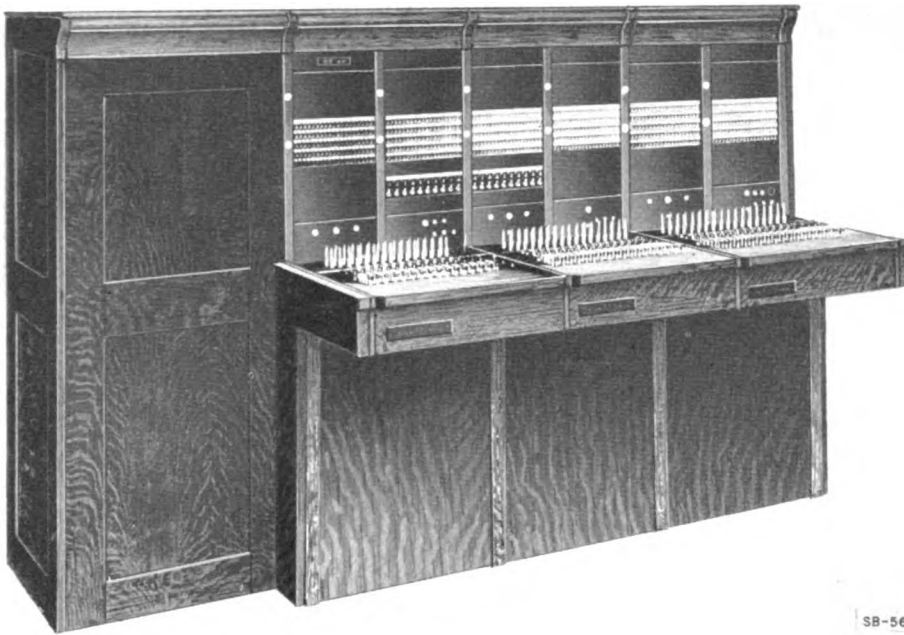
Distributor Frame TA-47/FT: 1.

Ringer TA-48/FT: 1.

Telephone TA-105/FTC: As required.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)	400	600
Total volume (cu ft)	24	40
Ship tons		1



SB-56/FTC

Figure 135. Switchboard SB-56/FTC.

Status: Limited/Std.

Switchboard SB-56/FTC is a three-position, manually operated, multiple-type, common battery telephone switchboard. The SB-56/FTC is inclosed in a wooden cabinet with removable rear covers, and it is equipped with common battery line circuits, common battery cord circuits, common battery trunks, two-way ringdown trunks, a wire chief's test circuit, a night-alarm circuit, and a fuse-alarm circuit. The cord circuits provide only one-lamp supervision on calls from local lines to the two-way ringdown trunks. Switching of through calls is not practical because the trunk circuits are not provided with the necessary re-ring feature.

Switchboard SB-56/FTC is intended for use in fixed-plant telephone systems, such as large depots or other permanent installations, where the switching of through calls is not required.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1 per position.
- Auxiliary telephone operator's circuit: 1 per position.
- Dial cord circuit: 1 per position.
- Common battery line circuits: 800 max.¹
- Common battery trunk circuits: 40.
- Two-way ringdown trunk circuits: 40.
- Panels per multiple appearance, lines and trunks: 4.
- Cord circuits: 15 per position.

- Type of cord circuit: Bridged impedance, series capacitor.
- Type of multiple: Bridged.
- Power of heating circuit: 1.
- Ringling: Front cord only.
- Night-alarm circuit: 1.
- Cable turning section: 1.
- Power supply required: 24 v dc, 11 cells.
- Distributing frame: Floor type.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
To common battery telephone.....	750	10,000
To common battery trunk.....	750	10,000

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Common battery line to common battery line: 1.2 db.
 - Common battery line to common battery trunk: 1.8 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: 1 db.
 - Operated: 2.3 db.
 - Monitoring key:
 - Operated: .2 db.

WEIGHT AND VOLUME

	Export pack ²
Total weight (lb)	7,500
Total volume (cu ft)	480
Ship tons.....	12

¹ Line and cut-off relays on all lines convertible to magneto.
² For three positions and associated equipment.

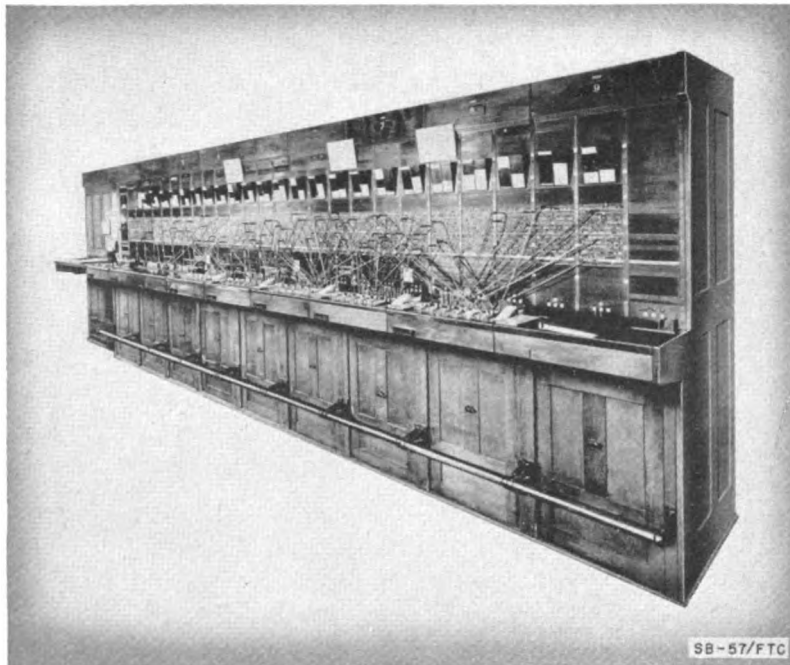


Figure 136. Switchboard SB-57/FTC.

Status: Limited/Std.

Switchboard SB-57/FTC is a large manually operated, multiple-type, common battery telephone switchboard. The SB-57/FTC is inclosed in a wooden cabinet with removable rear and lower front covers. It is floor-mounted and equipped with common battery line circuits, common battery or dial trunk circuits, a night-alarm circuit, and a fuse-alarm circuit. The cord circuits require two-way ringdown trunk equipment and are designed to provide re-ring signals.

Switchboard SB-57/FTC is intended for use in fixed-plant telephone systems and can be used as a local or combination local and long distance telephone switching center at large permanent installations that require a switching center of the capabilities of Switchboard SB-57/FTC.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1 per position.
- Auxiliary operator's telephone circuit: 1 per position.
- Dial: In operator's circuit.
- Common battery line circuits: 3,000 max.
- Common battery trunk circuits: 40.
- Two-way ringdown trunk circuits: 40.
- Panels per multiple appearance, lines and trunks: 6.
- Type of multiple: Bridged.
- Cord circuits: 17 per position.

Type of cord circuits: Bridged impedance, series capacitor.

Power and heating circuit: 1.

Ringing: Front cord only.

Night-alarm circuit: 1.

Battery and ground circuit: 1.

Power supply required: 24 v dc, 11 cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Maximum conductor loop	Minimum insulation resistance
To common battery telephone.....	835	10,000
To common battery trunks.....	800	10,000

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

(1) Average losses caused by equipment in switchboard connection:

Common battery line to common battery line:

.4 db.

Common battery line to common battery trunk:

.7 db.

(2) Added losses due to operator's circuit bridge:

Push to talk key:

Normal: 1 db.

Operated: 2.5 db.

Monitoring key:

Operated: .2 db.

WEIGHT AND VOLUME

	Export pack ¹
Total weight (lb).....	7,800
Total volume (cu ft).....	430
Ship tons.....	11

¹ For five positions and associated equipment.

and magneto central office in small fixed-plant telephone systems. It is intended for use in permanent or semipermanent installations in the communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Auxiliary operator's telephone circuit: 1.
- Dial cord circuit: 1.
- Common battery line circuits: 100.¹
- Common battery or dial circuits: 10.
- Cord circuits: 15.
- Type of cord circuit: Repeating coil battery feed (universal).
- Power and heating circuit: 1.
- Grouping key circuit: 1.
- Ringing: Front and rear cords.
- Emergency ringing (hand generator): 1.
- Night-alarm circuit: 1.
- Fuse-alarm circuit: 1.
- Battery and ground circuit: 1.
- Power supply required: 24 v dc, 11 cells.
- Distributing frame: Floor type not furnished.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
Magneto line to magneto line:		
No repeat coil.....	3, 000	1, 000
With repeat coil.....	2, 000	1, 000
Common battery line to common battery line.	1, 400	5, 000
Common battery line to common battery trunk.	70 less than limit of distant office.	Controlled by limits of distant office.

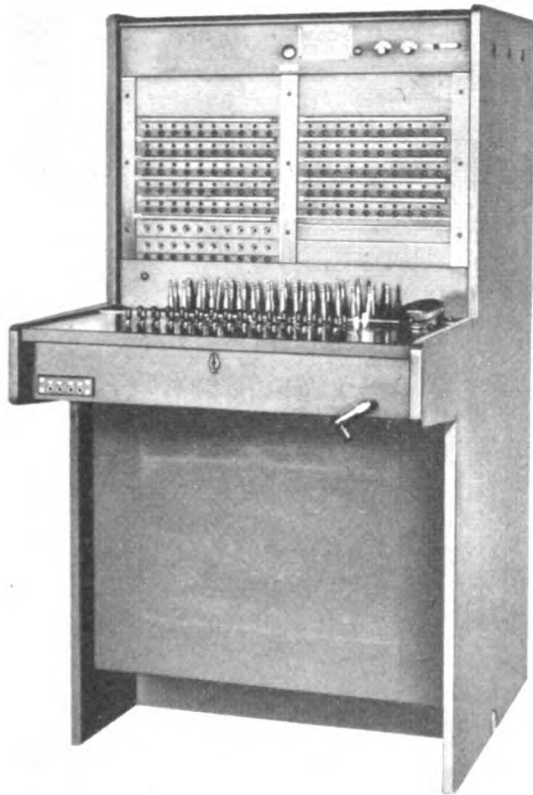
c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Magneto line to magneto line: .6 db.
 - Magneto line to common battery line: .6 db.
 - Magneto line to trunk: .7 db.
 - Common battery line to common battery line: .6 db.
 - Common battery line to trunk: .7 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: .5 db.
 - Operated: 2 db.
 - Monitoring key:
 - Operated: .2 db.

¹ Local telephone line circuits are such that by a simple wiring change any line may be converted from common battery to magneto or vice versa. The magneto lines can then be used for two-way ringdown trunk terminations.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	487	700
Total volume (cu ft).....	24	40
Ship tons.....		1



SB-58/FTC

Figure 137. Switchboard SB-58/FTC.

Status: Limited/Std. Stock No.: 4C12100-7.

Switchboard SB-58/FTC is a two-panel, single-position, manually operated, nonmultiple, common battery switchboard. The SB-58/FTC is inclosed in a plywood cabinet, reinforced to withstand rough handling and equipped with a removable rear cover. The SB-58/FTC is floor-mounted and includes convertible common battery to magneto line circuits, common battery or dial trunk circuits, a night-alarm circuit, and a fuse-alarm circuit. The cord circuits provide one-lamp supervision on calls from local lines to trunks. Two-lamp supervision is given on magneto to magneto trunks.

Switchboard SB-58/FTC can be used as a common battery or combination common battery

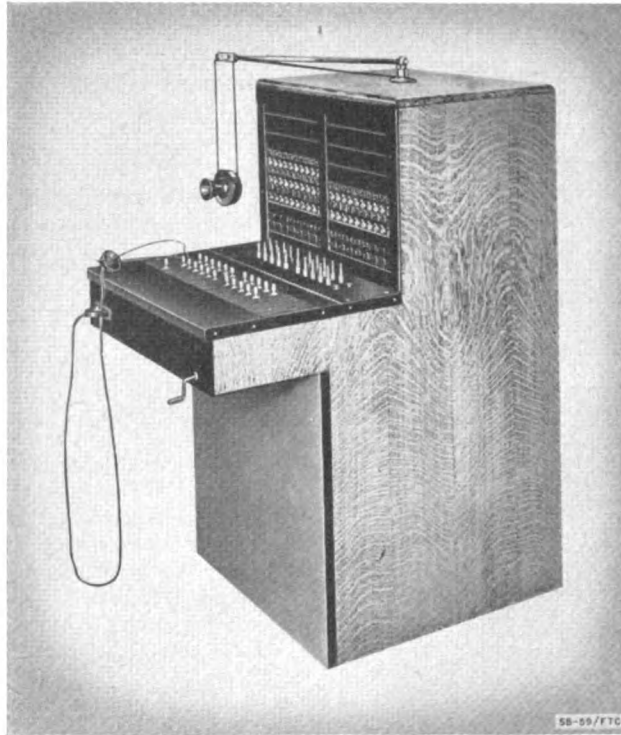


Figure 138. Switchboard SB-59/FTC.

Status: Limited/Std. Stock No.: 4C18100-1.

Switchboard SB-59/FTC is a two-panel, single-position, manually operated, nonmultiple, common battery telephone switchboard. The SB-59/FTC is inclosed in an oak cabinet with removable rear covers. It is floor-mounted and equipped with common battery line circuits, common battery or dial trunk circuits, a night-alarm circuit, and a fuse-alarm circuit. Switchboard SB-59/FTC is not designed for connecting one trunk to another trunk for through-switching purposes.

Switchboard SB-59/FTC is intended for use in fixed-plant telephone systems of small permanent or semipermanent depots, posts, camps, or stations, where the switching of through calls is not required.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Dial: Wired for, but not equipped with dial.
- Common battery line circuits: 100.
- Common battery manual or dial trunks: 10.
- Cord circuits: 15.
- Type of cord circuit: Bridged impedance, series capacitor.
- Power and heating circuit: 1.
- Ringing: Front cord only.
- Emergency ringing (hand generator): 1.

Night-alarm circuit: 1.

Fuse-alarm circuit: 1.

Battery and ground circuit: 1.

Power supply required: 24 v dc, 11 cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To common battery telephone:		
With line relay.....	475	10,000
Without line relay.....	50	10,000
To common battery or dial trunks.	Limits of distant office.	10,000

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Common battery line to common battery line: 1.2 db.
 - Common battery line to trunk: 1.2 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key:
 - Normal: .2 db.
 - Operated: 2.3 db.
 - Monitoring key:
 - Operated: .2 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	390	581
Total volume (cu ft)	24	34.9
Ship tons .....		.87

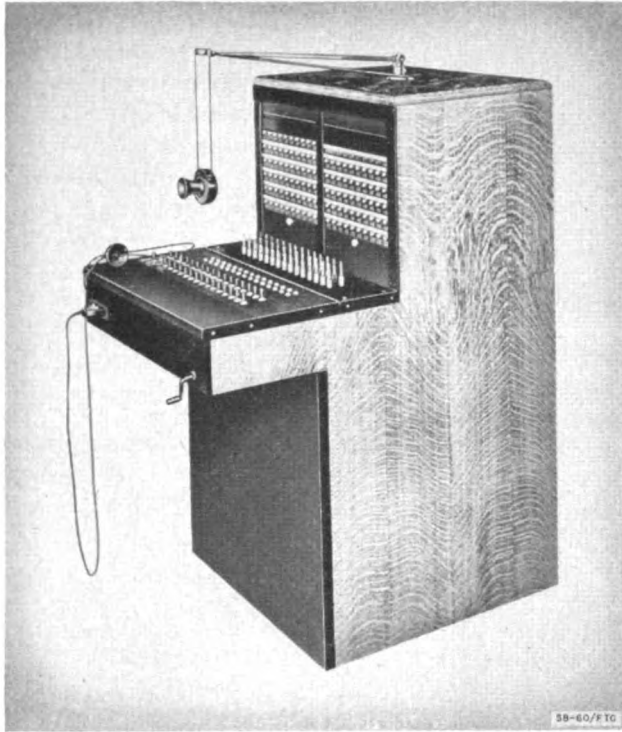


Figure 139. Switchboard SB-60/FTC.

Status: Limited/Std. Stock No.: 4C23100.

Switchboard SB-60/FTC is a two-panel, single-position, manually operated, nonmultiple, local battery, magneto-type telephone switchboard. The SB-60/FTC is inclosed in an oakwood cabinet with a removable rear cover. It is floor-mounted and equipped with magneto line circuits, cord circuits, night-alarm circuits, and fuse-alarm circuits. Signaling on the line circuits and supervision on the cord circuits is accomplished by means of drop signals. Any of the magneto line circuits can be used as two-way ringdown trunk circuits.

Switchboard SB-60/FTC is intended for use in fixed-plant telephone systems of small permanent or semipermanent depots, posts, camps, or stations, where the quality of the outside plant or the length of the local circuits prohibits the use of a common battery switchboard.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

Operator's telephone circuit: 1.

Local battery, magneto line circuits: 100.

Trunks: No special trunk circuits.

Cord circuits: 15.

Type of cord circuit: Two-drop supervision nonring through magneto.

Ringling: Front and rear cords.

Emergency ringing (hand generator): 1.

Night-alarm circuit: 1.

Power supply required: 3 v dc, dry cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To magneto telephone or trunk:		
No repeat coils.....	3,000	1,000
With repeat coils.....	2,000	1,000

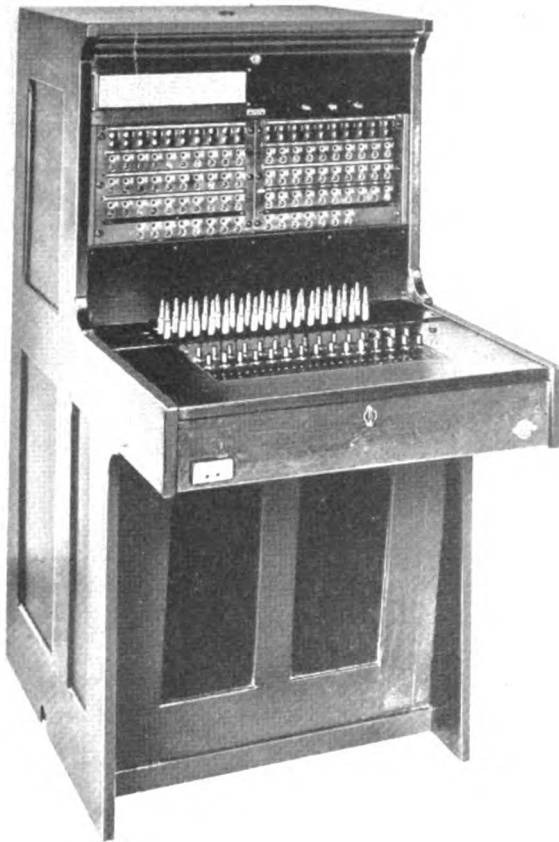
c. TRANSMISSION LOSSES AT 1,000 CYCLES:

Push to talk key operated: 2.3 db.

Monitoring key operated: .2 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	390	575
Total volume (cu ft).....	24	40
Ship tons.....	-----	1



SB-61/FTC

Figure 140. Switchboard SB-61/FTC.

Status: Limited/Std.

Switchboard SB-61/FTC is a two-panel, single-position, manually operated, nonmultiple, common battery telephone switchboard. The SB-61/FTC is inclosed in a wooden cabinet. It is floor-mounted and equipped with common battery line circuits, cord circuits, two-way ringdown trunk circuits, and a night-alarm circuit. Signaling on the line circuits and supervision on the cord circuits is accomplished by means of lamp signals. When the switchboard is unattended, a through

connection to a central office may be left up for any of the station lines. This switchboard is not intended for the switching of through calls.

Switchboard SB-61/FTC is intended for use in fixed-plant telephone systems of small permanent or semipermanent depots, posts, camps, or stations, where the switching of through calls is not required.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Dial: Operator's circuit wired, but not equipped with dial.
- Common battery line circuits: 80.
- Common battery manual or dial trunks: 15.
- Cord circuits: 15.
- Type of cord circuit: Through battery feed on trunk connection.
- Power and heating circuit: 1.
- Ringing: Front and rear cords.
- Emergency ringing (hand generator): 1.
- Night-alarm circuit: 1.
- Battery and ground circuit: 1.
- Power supply required: 24 v dc, 11 cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To common battery telephone.	155	17, 500
To common battery office trunk.	See note below.	20, 000

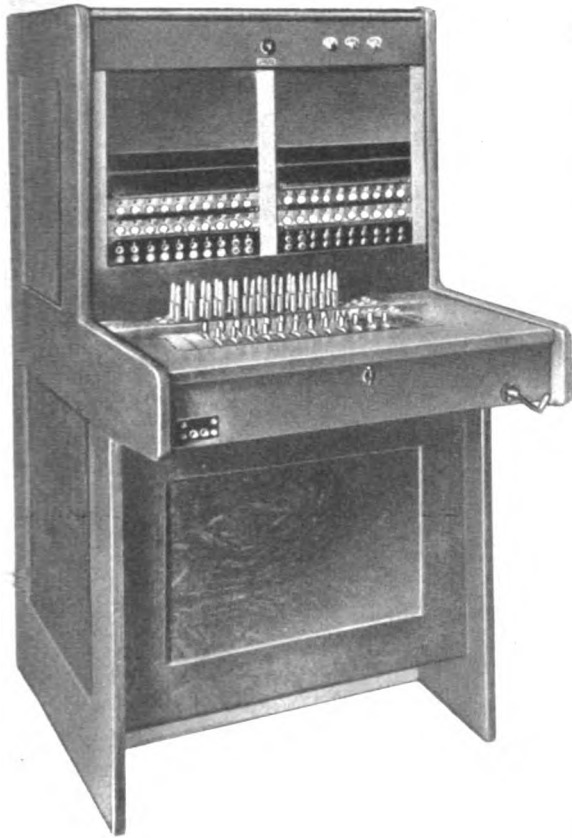
Note. Talking battery for the local telephone line when connected to a trunk is supplied over that trunk from the distant office. Therefore, the max trunk conductor loop resistance is equal to the limits of the distant office minus twice the conductor loop resistance of the longest local to which trunk service is to be given.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Common battery line to common battery line: .5 db.
 - Common battery line to trunk: .8 db.
 - Common battery line to tie trunk: 1 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key operated: 1.5 db.
 - Monitoring key operated: .2 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	500	700
Total volume (cu ft).....	24	40
Ship tons.....		1



SB-62/FTC

Figure 141. Switchboard SB-62/FTC.

Status: Limited/Std. Stock No.: 4C17063-1A.

Switchboard SB-62/FTC is a two-panel, single-position, manually operated, nonmultiple, common battery telephone switchboard. The SB-62/FTC is inclosed in an oak cabinet with a removable rear cover. It is floor-mounted and equipped with common battery line circuits, cord circuits, two-way ringdown trunk circuits, and a night-alarm circuit. Signaling on the line circuits and supervision on the cord circuits is accomplished by means of lamp signals. When the switchboard is unattended, a through connection

to a central office may be left up for any of the station lines. This switchboard is not intended for the switching of through calls.

Switchboard SB-62/FTC is intended for use in fixed-plant telephone systems of small permanent or semipermanent depots, posts, camps, or stations, where a small switching center of the capabilities of Switchboard SB-62/FTC is required and where the switching of through calls is not required.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Dial circuit: In operator's circuit.
- Common battery line circuits: 40.
- Common battery, manual, or dial trunks: 10.
- Cord circuits: 10.
- Type of cord circuit: Single retard coil, battery feed on local calls only; through battery feed on trunk connection.
- Power and heating circuit: 1.
- Ringling: Front and rear cords.
- Emergency ringing (hand generator): 1.
- Night-alarm circuit: 1.
- Battery and ground circuit: 1.
- Power supply required: 24 v dc, 11 cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To common battery telephone.	155-----	17,500
To common battery office trunk.	See note below.	20,000

Note: Talking battery for the local telephone line when connected to a trunk is supplied over that trunk from the distant office. Therefore, the max trunk conductor loop resistance is equal to the limits of the distant office minus twice the conductor loop resistance of the longest local to which trunk service is to be given.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Common battery line to common battery line: .5 db.
 - Common battery line to trunk: .8 db.
 - Common battery line to tie trunk: 1 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key operated: 1.5 db.
 - Monitoring key operated: .2 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)-----	500	700
Total volume (cu ft)-----	24	40
Ship tons-----		1

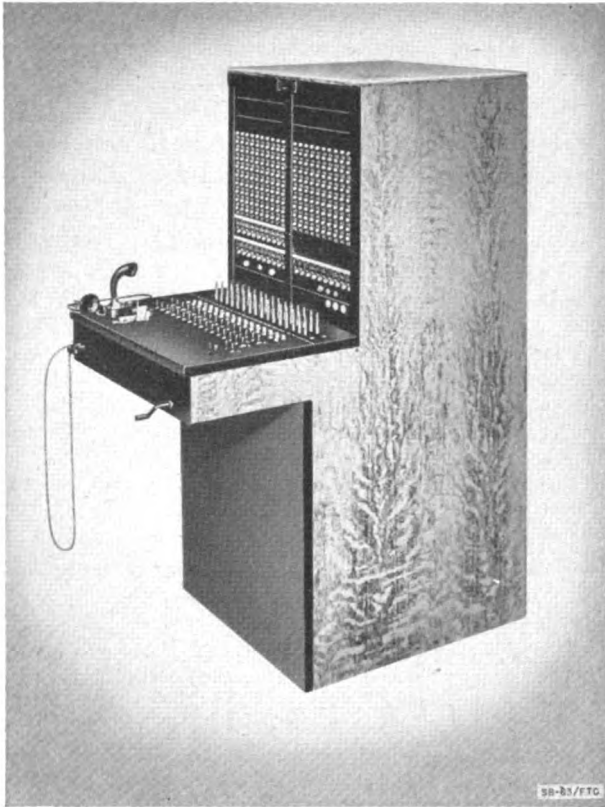


Figure 142. Switchboard SB-63/FTC.

Status: Limited/Std. Stock No.: 4C18100-3.

Switchboard SB-63/FTC is a two-panel, single-position, manually operated, nonmultiple, combination common battery and local battery telephone switchboard. The SB-63/FTC is inclosed in a wooden cabinet with a removable rear cover. It is floor-mounted and equipped with common battery line circuits, convertible common battery to magneto line circuits, magneto line circuits, universal cord circuits, a night-alarm circuit, and a fuse-alarm circuit. Trunks are provided for connection to individual lines in manual or dial common battery central offices and are ringdown incoming and automatic outgoing. Magneto lines can be used as two-way ringdown trunk terminations. Calls can be switched for through connections from a two-way ringdown trunk to another of the same type.

Switchboard SB-63/FTC is intended for use in fixed-plant telephone systems of small permanent or semipermanent depots, posts, camps, or stations, where the varying length of the local loops and the quality of the outside plant calls for the use of a switching center that has the capabilities of Switchboard SB-63/FTC.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1.
- Dial circuit: In operator's telephone circuit.
- Common battery line circuits: 40.
- Common battery convertible to magneto line circuits: 40.
- Magneto line circuits: 20.
- Common battery manual or dial trunks: 10.
- Cord circuits: 15.
- Type of cord circuit: Universal.
- Ringing: Front and rear cords.
- Emergency ringing (hand generator): 1.
- Night-alarm circuit: 1.
- Fuse-alarm circuit: 1.
- Battery and ground circuit: 1.
- Power supply required: 24 v dc, 11 cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To magneto telephone.....	1,500.....	10,000.
To common battery telephone..	500.....	10,000.
To common battery trunk...	Working limits of distant office.	Working limits of distant office.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
 - Magneto line to magneto line: .6 db.
 - Magneto line to common battery line: .6 db.
 - Magneto line to trunk: .7 db.
 - Common battery line to common battery line: .7 db.
 - Common battery line to trunk: .7 db.
- (2) Added losses due to operator's circuit bridge:
 - Push to talk key operated: 2.3 db.
 - Monitoring key operated: .2 db.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	500	700
Total volume (cu ft).....	24	40
Ship tons.....		1

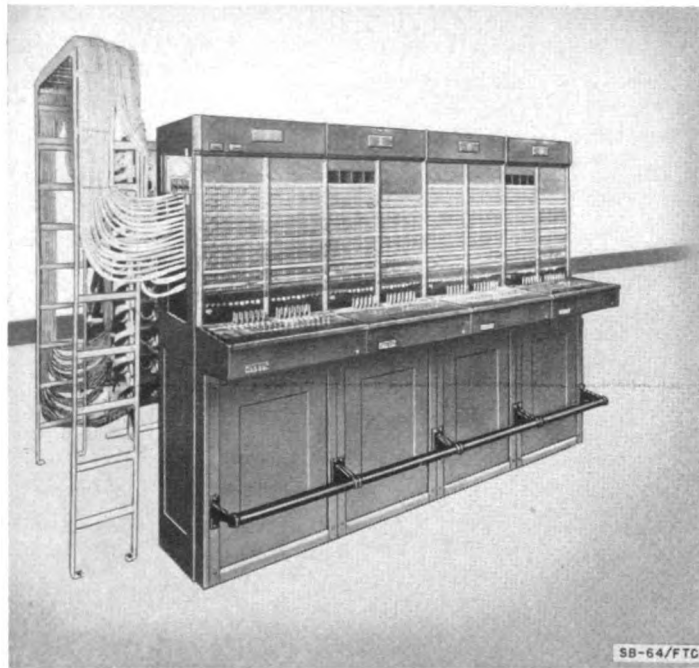


Figure 143. Switchboard SB-64/FTC.

Status: Limited/Std. *Stock No.:* 4C17063-12.

Switchboard SB-64/FTC is a large manually operated, multiple-type, common battery telephone switchboard, consisting of several positions of two panels each. It is designed for growth of positions from left to right only. The SB-64/FTC is inclosed in a wooden cabinet with removable rear and lower front covers. It is floor-mounted and equipped with common battery line circuits, two-way ringdown trunk circuits, universal cord circuits, and a night-alarm circuit. Signaling on the line circuits and supervision on the cord circuits is accomplished by means of lamp signals. The universal cord circuits provide nonlocked-in, ring-off, and re-ring signals for magneto lines and two-way ringdown trunks. This signal is a third lamp in each cord circuit, mounted in the face of the switchboard. Switching of through calls from one two-way ringdown trunk to another is possible with the universal cord circuits.

Switchboard SB-64/FTC is intended for use as a local or local and long distance switching central at permanent installations of large headquarters, such as the headquarters of a large base section or at a large post or camp. It should be used in a situation where the line capacity and traffic handling requirements are expected to increase in time. The SB-64/FTC is normally issued with three positions. Additional positions may be ordered as requirements increase.

TECHNICAL CHARACTERISTICS

a. EQUIPMENT DATA:

- Operator's telephone circuit: 1 per position.
- Auxiliary operator's telephone circuit: 1 per position.
- Dial circuit: Dial cord.
- Common battery line circuits: 1,400 line relays available, but the number that can be used is limited.
- Two-way ringdown trunks with lamp signals: Space for 240, issued as required, and busy lamps can be provided on toll lines.
- Panels per multiple appearance, lines and trunks: 4.
- Type of multiple: Series cut-off.
- Cord circuits: 15 per position.
- Type of cord circuit: Universal bridged impedance, series capacitor.
- Grouping key circuit: 1 per position.
- Ringling: Front and rear cords.
- Emergency ringling (hand generator): 1 per position.
- Battery and ground circuit: 1 per position.
- Power supply required: 48 v dc, 23 cells.

b. WORKING LIMITS IN OHMS:

Type of connection	Max conductor loop	Min insulation resistance
To common battery telephone.	1 500.....	10,000.
To common battery office....	2 500.....	L i m i t s d i s t a n t o f f i c e c o n t r o l l i n g.
To two-way ringdown trunk:		
No repeat coils.....	3,000.....	1,000.
With repeat coils.....	2,000.....	1,000.

¹For line without line relays and with only two lamps per line.

²This figure is the min and may be exceeded, depending on type of trunk.

c. TRANSMISSION LOSSES AT 1,000 CYCLES:

- (1) Average losses caused by equipment in switchboard connection:
- Magneto line to magneto line: .2 db.
 - Magneto line to common battery line: .4 db.
 - Magneto line to trunk: 1.1 db.
 - Common battery line to common battery line: .5 db.
 - Common battery line to trunk: 1.1 db.

- (2) Added losses due to operator's circuit bridge:
- Push to talk key operated: 2.5 db.
 - Monitoring key operated: .2 db.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	3,360	³ 7,500
Total volume (cu ft).....	112	³ 480
Ship tons.....		12

³ Weight and cubic contents of three-position switchboards and associated equipment are estimates.

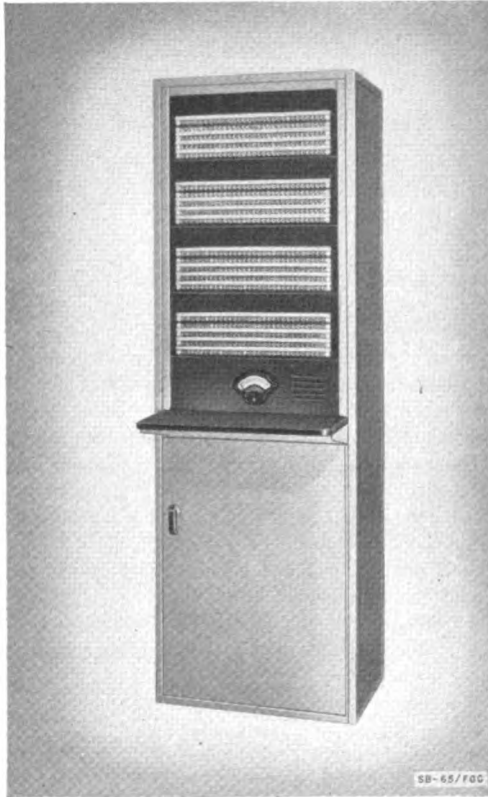


Figure 144. Switchboard SB-65/FGC.

Status: Standard. *Reference:* TM 11-2227.

Switchboard SB-65/FGC is a telegraph switchboard of the cord and jack patching type. It is used for interconnecting loops, extensions, and teletypewriter sets. The SB-65/FGC is mounted in a floor-supported steel cabinet, finished in light gray. The cabinet is approximately 84 inches high, 27 inches wide, and 18 inches deep. A writing shelf about 27 inches wide is mounted on the front of the switchboard at a point 40 inches above

the floor. The lower part of the cabinet is utilized as a storage place for the patching cords when not in use. The basic unit of the SB-65/FGC is a set of four jacks designated LPG 1, LPG 2, SET 1, and SET 2. Located just below each basic unit is one miscellaneous jack. Teletypewriter equipment may be permanently connected to SET 1 and SET 2 jacks, line is connected to LPG 1 and LPG 2 jacks, and spare teletypewriter equipment, or test equipment, may be connected to the miscellaneous jacks. The Switchboard SB-65/FGC is equipped with a milliammeter which furnishes a means of making simple tests of associated line facilities. Provision is made in the design of the switchboard for connection of a telephone set for control purposes and a telegraph key and sounder for transmitting and receiving test.

TECHNICAL CHARACTERISTICS

- LINE CAPACITY: 120.
- LOCATION IN SYSTEM: Between long line and loop equipment and the telegraph central office.
- HOUSING: Mounted in steel cabinet.
- TOOLS REQUIRED FOR MAINTENANCE: Adjuster, spring contact burnisher gage, gram iron, soldering. Pliers: Duck-billed, long-nosed, side-cutting.
- AUXILIARY EQUIPMENT JACKS: 120.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Cabinet.....	1
Jack panel section.....	4
Milliammeter.....	1
Patching cord, 3 ft.....	30
Patching cord, 4 ft.....	30

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	510	1,090
Total volume (cu ft).....	23.5	40
Ship tons.....		1



Figure 145. Switchboard SB-66/FGC.

Status: Standard. *Stock No.:* 4A326. *Reference:* TM 11-2083.

Switchboard SB-66/FGC is a fixed-station teletypewriter switchboard designed to provide switching facilities for teletypewriter circuits. Each switchboard consists of six 6-key, self-restoring, push-key assemblies with separable connectors, horizontal and vertical designation strips, shorting switches, test switches, and line and equipment terminal strips. All parts are assembled in an all-metal black wrinkle-finish cabinet $7\frac{1}{4}$ inches wide, 9 inches high, and 7 inches deep, which is arranged for wall or desk mounting.

Switchboard SB-66/FGC is intended for use in situations where it is necessary to provide switching facilities for several teletypewriters but where the number of local and line circuits do not justify

the use of larger and more complex equipment. The SB-66/FGC is normally used in teletypewriter systems of fixed-plant installations at base sections or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 6.

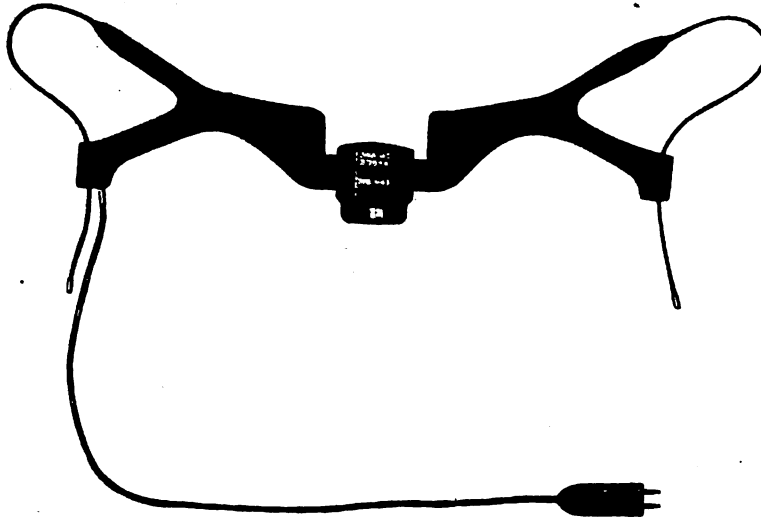
LOOP CAPACITY: 6.

LIGHTNING PROTECTION: Internal connection in switchboard, ground wire must be used.

TOOL AND TEST SETS REQUIRED FOR MAINTENANCE: Screw driver, 8 in. long, $\frac{1}{4}$ -in. blade; contact burnisher; long-nosed, side-cutting pliers; voltohmmeter.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	35	66
Total volume (cu ft).....	.3	2.3
Ship tons.....		.57



T-45

Figure 146. Microphone T-45.

Status: Standard. *Stock No.:* 2B1645. *Reference:* TM 11-336.

Microphone T-45 is a small, lightweight, rugged, noise-canceling, single-button microphone. The T-45 is equipped with a harness which loops around the user's ears and positions the microphone directly in front of the lips. It can be used with Chest Set H-18/GT or TD-1 as part of a telephone switchboard operator's head and chest set.

Microphone T-45 is designed for use under a gas mask, in those applications where free use of the hands is necessary, and for voice transmission in noisy locations.

TECHNICAL CHARACTERISTICS

NOMINAL OPERATING CURRENT: 50 ma.
 IMPEDANCE OF UNIT AT 1,000 CYCLES: Between 50 and 125 ohms.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Microphone Unit MC-419.....	1
Plug PL-291-A.....	1
Strap ST-53.....	1
Breath shield.....	1

WEIGHT AND DIMENSIONS

<i>Weight (lb)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Depth (in.)</i>
.2	.5	.4	.2

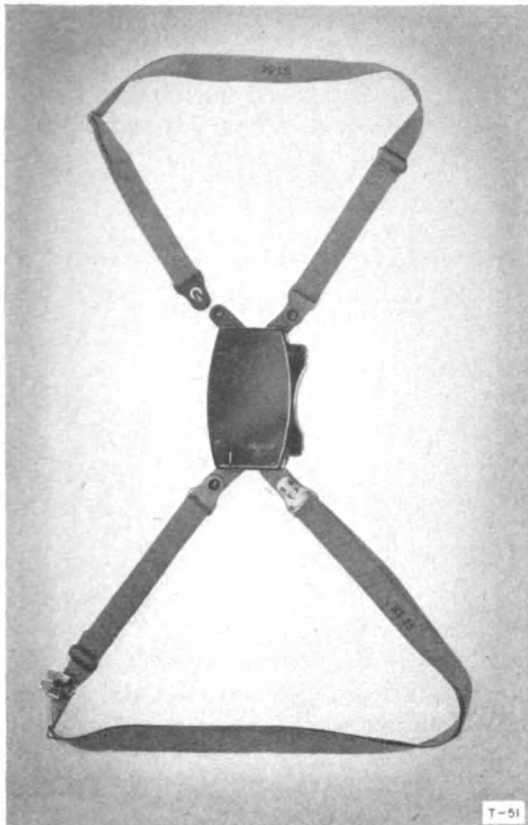


Figure 147. Chest Unit T-51.

Status: Standard. *Stock No.:* 4B419-51. *Reference:* TM 11-2564.

Chest Unit T-51 consists of a two-position (LOCK ON and HOLD ON) switch and socket for connection to Jack JK-53, a jack for Plug PL-54, and a jack for Plug PL-291 or PL-291-A.

Chest Unit T-51 provides facilities for the interconnection of Cord CD-802, Headset H-16/U, and Microphone T-45. It is part of Chest Set TD-4 and as such is a component of Intercommunication Set PA-8.

WEIGHT AND DIMENSIONS

<i>Weight (lb)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Depth (in.)</i>
.7	6	3	1 $\frac{3}{8}$

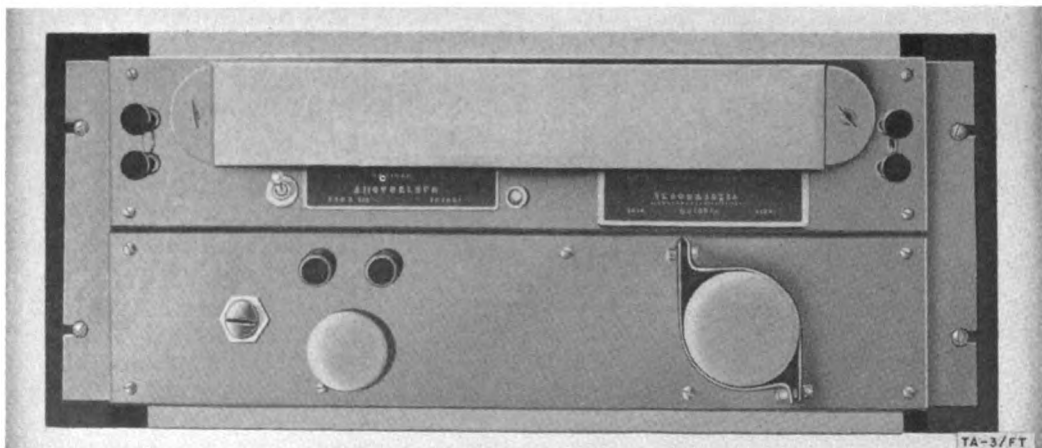


Figure 148. Ringer TA-3/FT.

Status: Standard. *Stock No.:* 4F2050-3. *Reference:* TM 11-2011.

Ringer TA-3/FT is a v-f ringer consisting of a ringer unit and a power unit. It is designed for converting l-f ringing signals (20 cycles) to 1,000/20 or 500/20 cycles for transmission over a tele-

phone circuit which uses carrier equipment or v-f repeaters. It also receives 1,000/20- or 500/20-cycle ringing current from the transmission line, and converts it to 19- or 20-cycle ringing current for operation of the switchboard drops or line lamp equipment.

Ringer TA-3/FT provides ringing facility for one telephone channel when such a channel involves terminal or repeater equipment which will not normally pass l-f ringing current. The TA-3/FT is designed primarily for a-c operation but will operate from a storage battery in an emergency. The TA-3/FT is intended for use in fixed-plant installations of a communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Output: 0 dbm or +6 dbm.
LOCATION IN SYSTEM: At termination of telephone channel before connection to switchboard.

RANGE: 30-db net loss channel.
POWER SUPPLY REQUIRED: 115 to 230 v, 50 to 60 cyc ac or 12-v storage battery.
NORMAL A-C POWER CONSUMPTION: 10 w.
STAND-BY POWER: 12-v storage battery; uses 1.1 amp.
TUBE COMPLEMENT: 5 ea 6G6-G.
FREQUENCIES:
 Line side: 1,000/20 or 500/20 cyc.
 Local side: 19 to 20 cps.
 Line termination: 2-wire, 600-ohm impedance.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	26	70
Total volume (cu ft).....	.9	3.6
Ship tons.....		.1

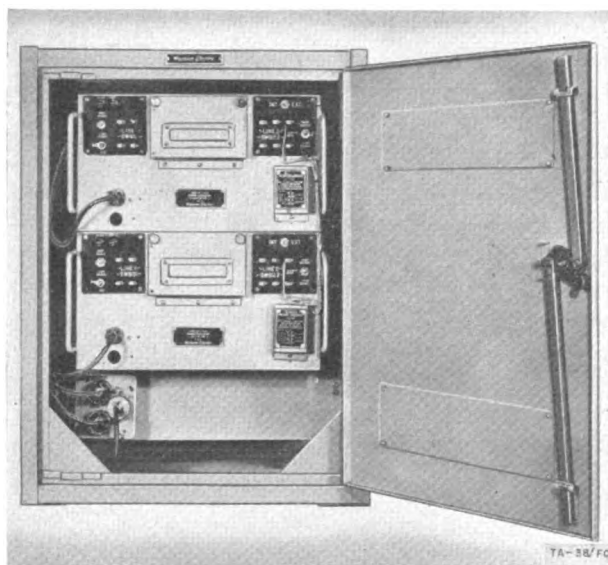


Figure 149. Ringer TA-38/FC.

Status: Limited/Std. *Stock No.:* 4F2093. *Reference:* TM 11-2021.

Ringer TA-38/FC consists of a cabinet which contains two v-f ringer units, each of which provides two ringing circuits. At the bottom are located a static ringing generator, which supplies 20-cycle ringing current, and an outlet box which terminates the incoming power supply leads and distributes this supply to the ringer units and to the ringing generator. Connections to the line and other equipment are made by soldering the con-

necting wires to the terminals on the face of each ringer unit. Three toggle switches and a terminal strip for internal power connections are also located on the face of each ringer unit.

Ringer TA-38/FC is designed for fixed-plant use with other items of packaged equipment. The TA-38/FC is used to provide signaling over voice channels and telephone lines which will not transmit l-f ringing current sent from switchboards or magneto telephone sets. It will provide ringing facilities for voice circuits derived from a carrier system, or from lines equipped with v-f telephone repeaters, composite telegraph sets, or both. One ringing circuit is required at each end of the telephone channel.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: 0 to -3 dbm.
LOCATION IN SYSTEM: At terminal of telephone channel before connection to switchboard.
RANGE: 30-db net loss channel.
POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: 75 w.
TUBE COMPLEMENT: 2 ea 6V6, 12 ea 6SJ7.
RUNNING SPARES: Tubes and fuses.
HOUSING: Panels mounted in metal cabinet.
FREQUENCIES:
 Line side: 1,000/20 cyc.
 Switchboard side: 20 cps.
LINE TERMINATION: 2-wire, 600-ohm impedance.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	245	325
Total volume (cu ft).....	6.5	11
Ship tons.....		.27

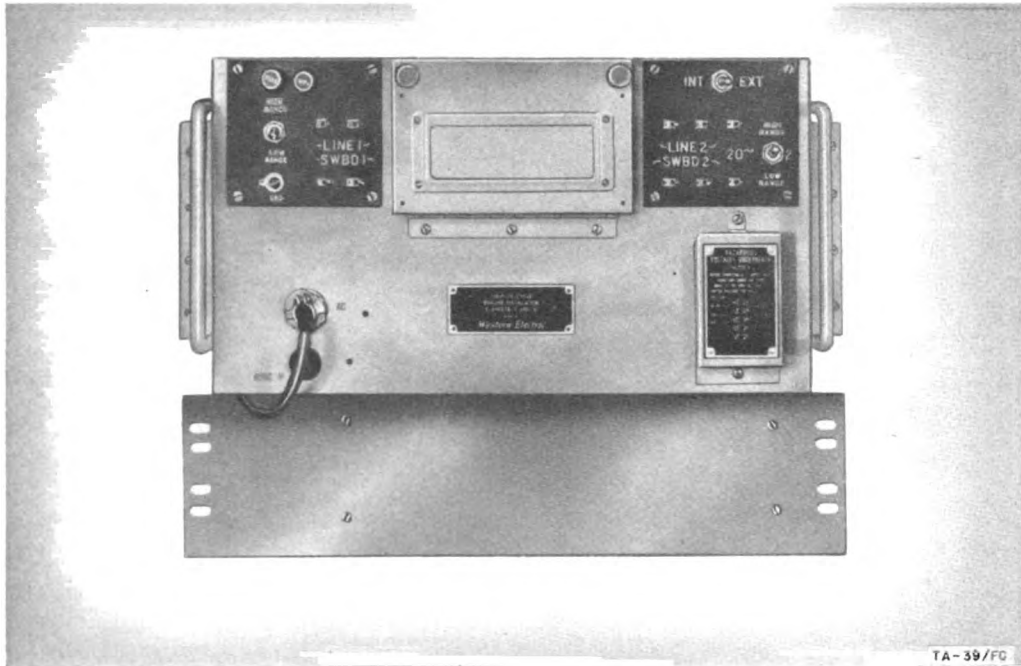


Figure 150. Ringer TA-39/FC.

Status: Limited/Std. Stock No.: 4F2060B. Reference: TM 11-2021.

Ringer TA-39/FC consists of one v-f ringer unit which provides two ringing circuits and one static ringing generator. The equipment is designed to be mounted on a standard 19-inch panel, which requires eight mounting plate spaces or 14 inches of relay rack or cabinet space. Connections to the line and other equipment are made by soldering the connecting wires to the terminals on the face of each ringer unit. Three toggle switches and a terminal strip for internal power connections are also located on the face of each ringer unit.

Ringer TA-39/FC is designed for use with other fixed-plant items of packaged equipment. The TA-39/FC is used to provide signaling over voice channels and telephone lines which will not transmit l-f ringing current sent from switchboard or magneto telephone sets. It will provide ringing facilities for voice circuits derived from a carrier system or from lines equipped with v-f

telephone repeaters, composite sets, or both. One ringing circuit is required at each end of the telephone channel.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: 0 to -3 dbm.
 LOCATION IN SYSTEM: At terminal of telephone channel before connection to switchboard.
 RANGE:
 Line side: 30-db net loss channel.
 Local side: 800 ohms.
 Power supply required: 115 v, 50 to 60 cyc ac.
 Normal a-c power consumption: 40 w.
 Tube complement: 1 ea 6V6, 6 ea 6SJ7.
 Running spares: Tubes and fuses.
 FREQUENCIES:
 Line side: 1,000/20 cyc.
 Switchboard side: 20 cps.
 Line termination: 2-wire, 600-ohm impedance.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	90	145
Total volume (cu ft).....	1.05	5.3
Ship tons.....		.1

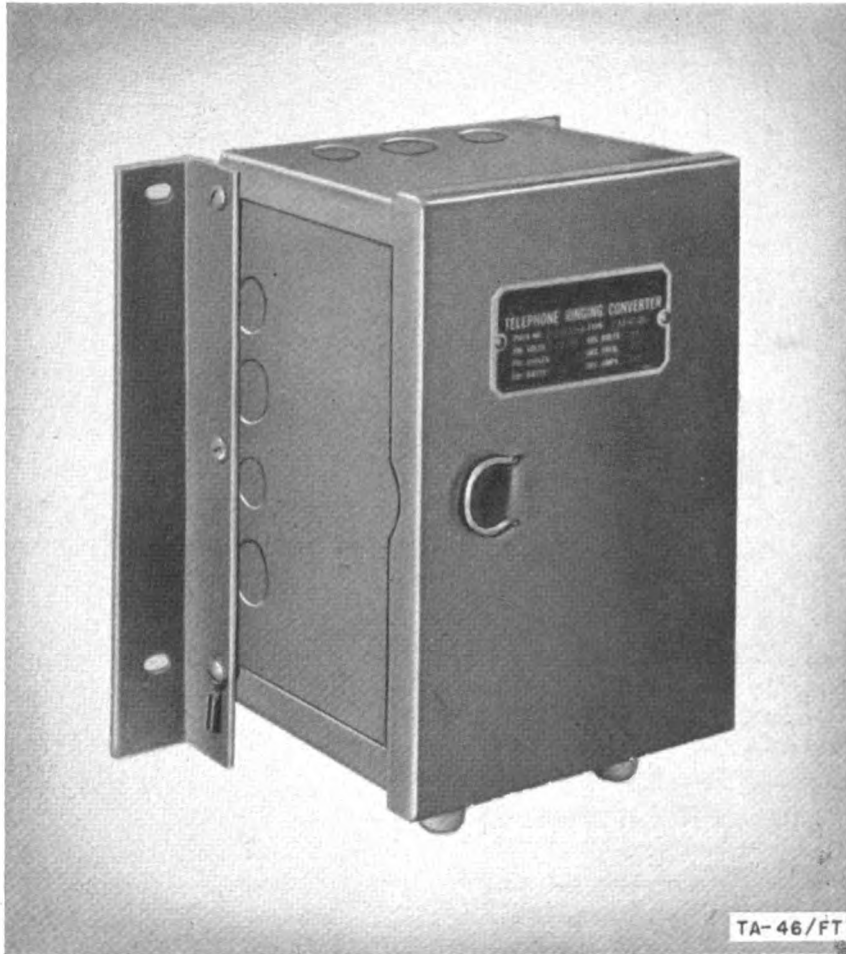


Figure 151. Ringing Inverter TA-46/FT.

Status: Standard. *Stock No.:* 4F303. *Reference:* TM 11-2051.

Ringing Inverter TA-46/FT is a vibrating-pole-changer type of ringing equipment, which is housed in a rectangular steel cabinet with a hinged cover. Standard knock-outs are provided in the bottom and top of the cabinet for the installation of connecting wiring in conduit. The TA-46/FT is intended to be wall-mounted and is designed to supply ringing current for common battery manual telephone switchboards. Nominal 20-cps ringing current is delivered when the unit is supplied with 24-volt dc. The TA-46/FT will supply ungrounded ringing current or divided ringing to ground for party ringing, if required.

Ringing Inverter TA-46/FT is intended for use

with small common battery telephone exchanges in fixed-plant installations at small depots, posts, camps, or stations where a source of ac is not readily available.

TECHNICAL CHARACTERISTICS

OUTPUT VOLTAGE AND FREQUENCY: 19 to 22 cps, 75 v no load, 65 v at .095 amp.

POWER SUPPLY REQUIRED: 12 w, 24 v and 48 v dc.
CAPACITY: 8 telephone ringers may be operated simultaneously.

FUSE ALARM: Not furnished; may be installed.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	18.25	44
Total volume (cu ft).....	.5	1.7
Ship tons.....		.0375

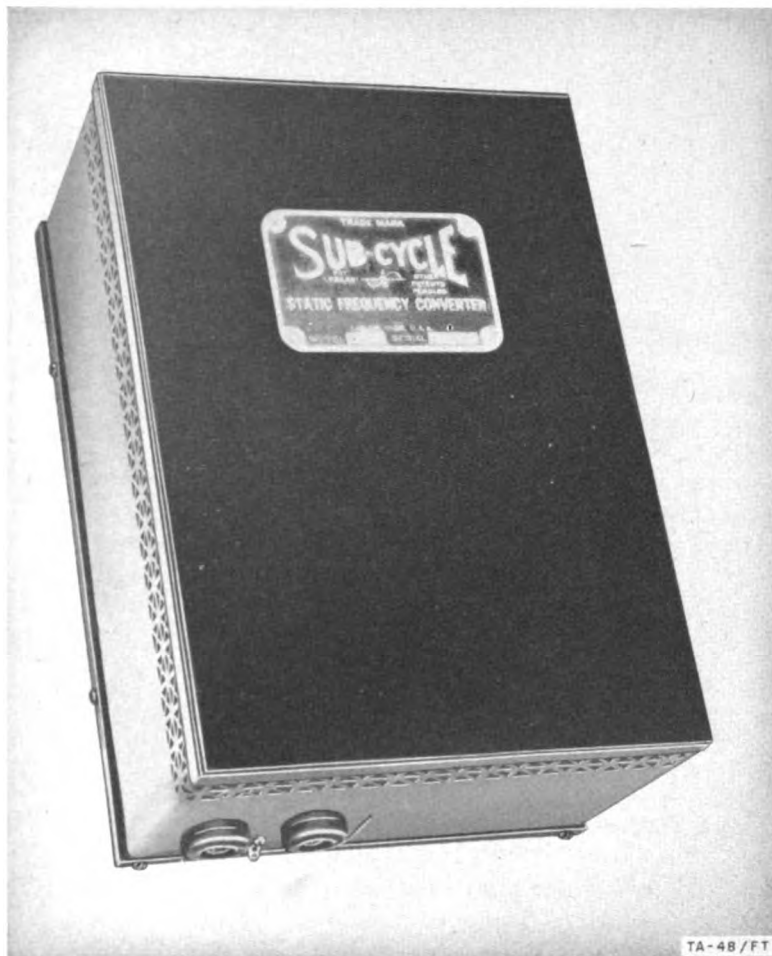


Figure 152. Ringer TA-48/FT.

Status: Standard. *Stock No.:* 4F2315.

Ringer TA-48/FT is a static-type ringer, better known under the name of subcycle ringer. It is housed in a metal cabinet with a black-wrinkle lacquer finish. The TA-48/FT is intended to be mounted on a wall or on the distributing frame of a small telephone central office. It is designed to supply ringing current for common battery manual telephone switchboards. Nominal 20-cps ringing current is delivered when the unit is supplied with 115-volt, 60-cycle ac. The TA-48/FT will supply ungrounded ringing current or divided ringing to ground for party ringing, if required.

Ringer TA-48/FT is intended for use with small common battery telephone exchanges in fixed-

plant installations at small depots, posts, camps, or stations where a source of ac is readily available.

TECHNICAL CHARACTERISTICS

OUTPUT VOLTAGE AND FREQUENCY: 16 to 20 cps, 90 v no load, 75 v at .2 amp.

POWER SUPPLY REQUIRED: 105 to 125 v, 50 to 60 cyc ac.¹

Capacity: 6 to 8 telephone ringers may be operated simultaneously.

¹ 60-cycle input will give a 20-cycle output. 50-cycle input will give a 16 $\frac{2}{3}$ cycle output.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	30	54
Total volume (cu ft).....	.25	.5
Ship tons.....		.0125



Figure 153. Observing Set TA-50/FT.

Status: Standard. *Stock No.:* 4C1806. *Reference:* TM 11-2013.

Observing Set TA-50/FT is a single-position, turret-type, wooden cabinet, which is equipped with removable covers over the top, sides, and back and a hinged front panel. It consists of a telephone set, signal lamps, and control keys. All the keys, lamps, and telephone jacks are mounted on the front panel. The equipment for the circuit and power panel is mounted on the inside of the cabinet. Connections to the toll line and trunk are made through a plug and a socket. The plug is mounted on a plate inside the cabinet and the socket is attached to the end of a flexible cord. By operating the keys, the observer is able to—

- a. Know when a toll line is being used.
- b. Monitor the conversation over the toll line.
- c. Talk to both parties on the connection.
- d. Interrupt the conversation, hold the connection, and talk to one party while the other is cut off.
- e. Connect the toll line to a recorder so that a record of the conversation can be made.
- f. Talk to an operator at the switchboard or, if a patching cabinet is furnished, talk to the controller at the patching cabinet.
- g. Interrupt the conversation, hold the connection, and, at the same time, talk to the controller at the patching cabinet.

Observing set TA-50/FT is intended for use either by itself or in conjunction with Observing Control Cabinet TA-52/FT (patching cabinet) and a recorder. The TA-52/FT is used on fixed-plant long distance telephone circuits for intelligence purposes, security checks, and telephone traffic control information.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 1.
 POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac.
 NORMAL A-C POWER CONSUMPTION: 60 w.
 TUBE COMPLEMENT: 1 ea 2V25L6GT.
 LINE PROTECTION: Fuses.
 RUNNING SPARES: Fuses.
 POWER TRANSFORMER:
 Number of windings: 2.
 Type of operation: Step-down 220 to 110 v.
 Capacity: 1 kva.

PRINCIPAL COMPONENTS

Component	Quantity
Observing cabinet.....	1
Power transformer.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	186	300
Total volume (cu ft).....	6.5	12.4
Ship tons.....		.31

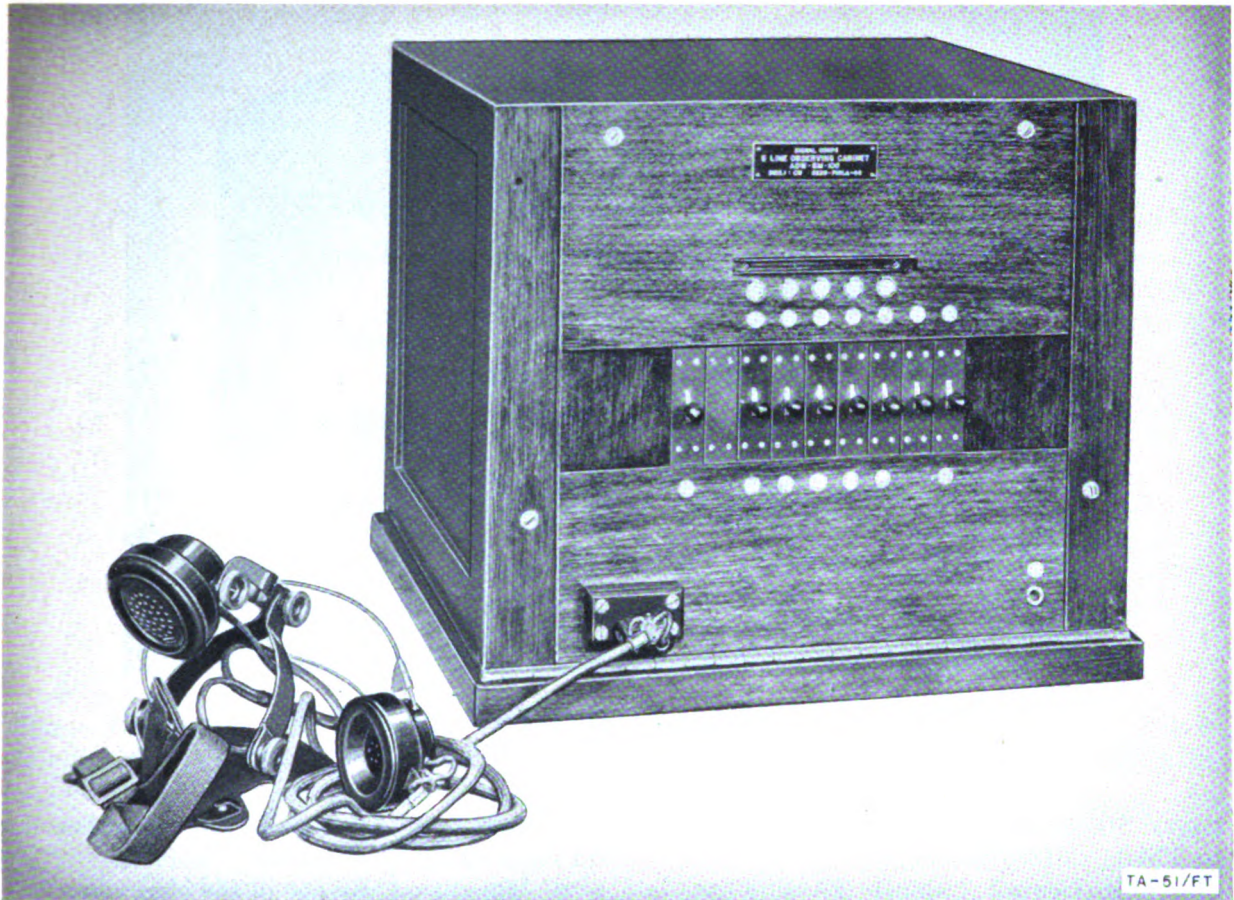


Figure 154. Observing Set TA-51/FT.

Status: Standard. *Stock No.:* 4C1806-8.

Observing Set TA-51/FT is a single-position, turret-type, wooden cabinet, and is equipped with a removable rear cover. It consists of a headset, signal lamps, and control keys. All the keys, lamps, and headset jacks are mounted on the front panel. The lamp signals indicate an established call. Arrangements are included for connecting an external recorder. Two TA-51/FT may be grouped for light-load operation. By operating the keys, the observer is able to—

- a. Know when a toll line is being used.
- b. Monitor the conversation over the toll line.
- c. Talk to both parties on the connection.
- d. Interrupt the conversation, hold the connection, and talk to one party while the other is cut off.
- e. Connect the toll line to a recorder so that a record of the conversation can be made.
- f. Talk to the operator at the switchboard.

Observing Set TA-51/FT is intended for use at fixed-plant telephone central offices within the zone of the interior for monitoring or observing telephone conversations for intelligence purposes, security checks, and telephone traffic control information.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 5.
 POWER SUPPLY REQUIRED: 20 to 26 v dc.
 NORMAL D-C POWER CONSUMPTION: 8 w.
 AUXILIARY EQUIPMENT; RECTIFIER: ¹
 POWER SUPPLY REQUIRED: 115 v, 60 cyc ac.
 NORMAL A-C POWER CONSUMPTION: 60 w.
 CAPACITY: 3 ea TA-51/FT.

WEIGHT AND VOLUME

	<i>Unpacked ²</i>
Total weight (lb).....	50
Total volume (cu ft).....	1.5

¹ Where 20 to 26 v dc is not available, WECO Rectifier KS-15003 may be specified.

² For use in continental United States; not moisture-proofed.



Figure 155. Observing Control Cabinet TA-52/FT.

Status: Standard. *Stock No.:* 4C1806-1. *Reference:* TM 11-2013.

Observing Control Cabinet TA-52/FT is a single-position wooden cabinet with the rear panel hinged at the bottom to permit access to the equipment inside. The face of the cabinet is arranged to mount observer-monitoring jacks, toll line jacks, associated lamps, and trunk keys. The controller's handset which is connected to the trunk circuits is mounted on the left end of the cabinet. Mounted on the rear panel of the cabinet, accessible from the outside, are multi-contact plugs which are used for connecting to the toll lines and to the toll observing cabinets (TA-50/FT). By observing the signal lamps and manipulating the keys and patching cords, the controller can—

- a. Know when a toll line is in use.
- b. Patch the toll line to any one of the observing cabinets.

c. Talk to an operator at the switchboard or to observers at the observing cabinets.

d. Monitor on any one of the observers.

Observing Control Cabinet TA-52/FT is used at large fixed-plant telephone central offices for connecting toll observing cabinets (TA-51/FT) to toll lines. It provides control, flexibility, and maximum use of observing equipment.

TECHNICAL CHARACTERISTICS

Observer-monitoring jacks: 10.

Toll line jacks: 10.

Observer jacks: 10.

Trunk keys: 2.

Power: Powered from power pack in Observing Set TA-50/FT (toll observing set).

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	68	189
Total volume (cu ft).....	1.5	5
Ship tons.....		.12

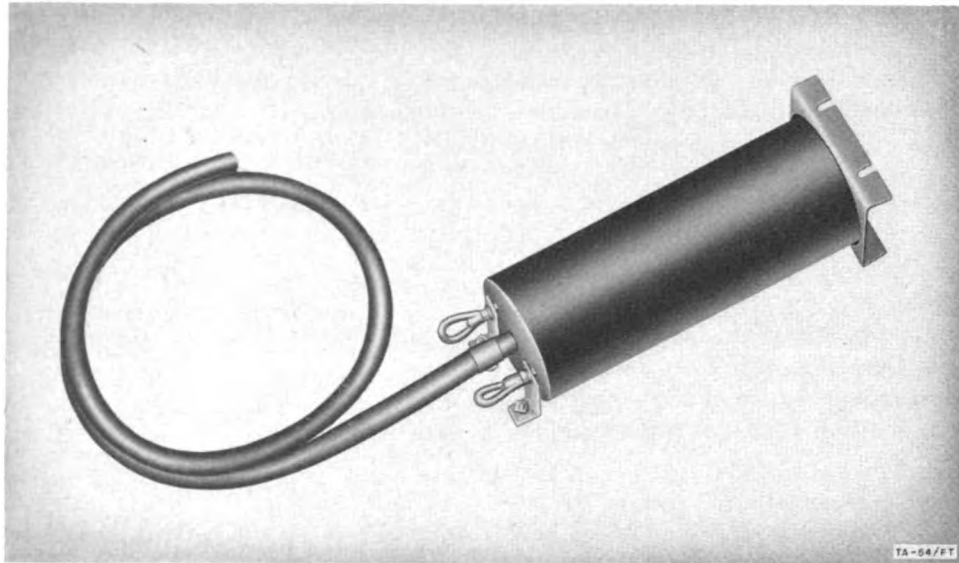


Figure 156. Loading Coil Case TA-54/FT.

Status: Limited/Std. Stock No.: 4B1811-26.

Loading Coil Case TA-54/FT is an underground type coil assembly inclosed in a welded steel case. It is composed of 26 phantom loading coils and is designed for installation on a manhole floor or wall. The TA-54/FT is issued equipped with a 10-foot #19 AWG cable stub. For proper installation, two ½-inch by 2½-inch expansion bolts are required and must be requisitioned separately.

Loading Coil Case TA-54/FT is designed to increase the transmission range of telephone cable by inserting lumped inductance at predetermined points in the side circuits and in the phantom circuit when the cable is being used for trans-

mission of v-f currents. The TA-54/FT is used for H-88-50 loading on phantom cable pairs.

TECHNICAL CHARACTERISTICS

INDUCTANCE PER UNIT FOR:

Side circuit: 88 mh.

Phantom circuit: 50 mh.

CUT-OFF FREQUENCY OF:

Side circuit: 4,000 cps.

Phantom circuit: 4,200 cps.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	195	280
Total volume (cu ft).....	1.15	15
Ship tons.....		.375

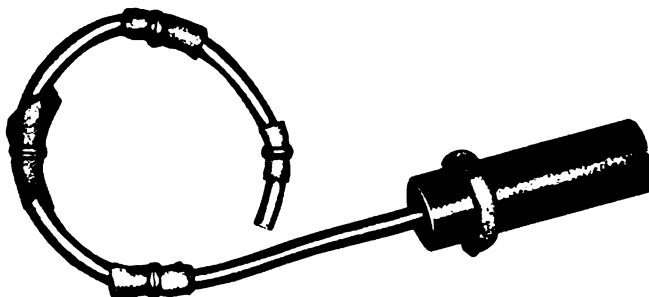


Figure 157. Loading Coil Case TA-55/FT.

Status: Standard. *Stock No.:* 4B1816.32-15.

Loading Coil Case TA-55/FT is a coil assembly inclosed in a lead sleeve case. It is composed of 15 loading coils and is intended for aerial or underground use. The TA-55/FT is issued equipped with a 10-foot #24 AWG cable stub. For proper installation on manhole walls, two No. 56 cable straps and four ¼-inch by 1-inch hammer drive anchors are required. For attachment to cable messenger two aerial supports are required. All hardware must be requisitioned separately.

Loading Coil Case TA-55/FT is designed to increase the transmission range of telephone cable by inserting lumped inductance at predetermined

points in the cable circuits, thereby reducing the circuit attenuation over the v-f band. The TA-55/FT is used for H-88 loading on nonphantom cable pairs.

TECHNICAL CHARACTERISTICS

INDUCTANCE PER UNIT: 88 mh.
 CUT-OFF FREQUENCY: 3,500 cps.
 NORMAL IMPEDANCE: 1,000 ohms.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	15	65
Total volume (cu ft).....	. 18	2. 75
Ship tons.....	-----	. 06



Figure 158. Loading Coil Case TA-56/FT.

Status: Standard. *Stock No.:* 4B1816.32-26.

Loading Coil Case TA-56/FT is a coil assembly inclosed in a lead sleeve case. It is composed of 26 loading coils and is intended for aerial or underground use. The TA-56/FT is issued equipped with a 10-foot #24 AWG cable stub. For proper installation on manhole walls, two No. 56 cable straps and four ¼-inch by 1-inch hammer drive anchors are required. For attachment to cable messenger two aerial supports are required. All hardware must be requisitioned separately.

Loading Coil Case TA-56/FT is designed to increase the transmission range of telephone cable by inserting lumped inductance at predetermined points in the cable circuits, thereby reducing the circuit attenuation over the v-f band. The TA-56/FT is used for H-88 loading on nonphantom cable pairs.

TECHNICAL CHARACTERISTICS

INDUCTANCE PER UNIT: 88 mh.
 CUT-OFF FREQUENCY: 3,500 cps.
 NORMAL IMPEDANCE: 1,000 ohms.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	25	72
Total volume (cu ft).....	. 28	4. 2
Ship tons.....	-----	. 1

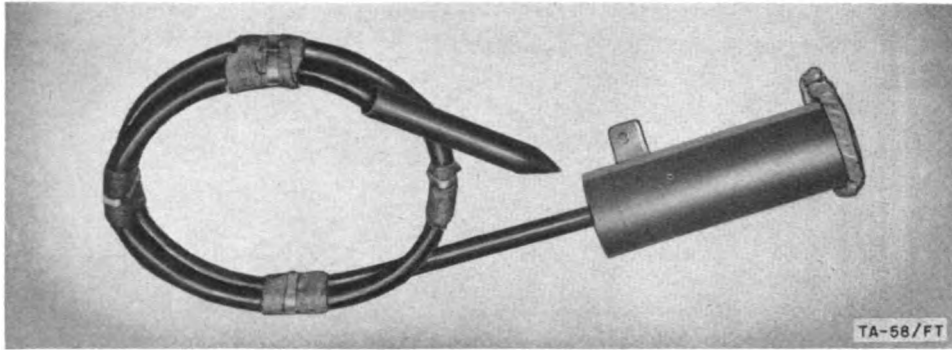


Figure 159. Loading Coil Case TA-58/FT.

Status: Standard. *Stock No.:* 4B1816.32-101.

Loading Coil Case TA-58/FT is a coil assembly inclosed in a welded steel case. It is composed of 101 loading coils and is intended for aerial use. The TA-58/FT is issued equipped with a 10-foot #24 AWG cable stub. For proper installation on poles, four $\frac{1}{2}$ - by $4\frac{1}{2}$ -inch drive screws are required and must be requisitioned separately.

Loading Coil Case TA-58/FT is designed to increase the transmission range of the telephone cable by inserting lumped inductance at predetermined points in the cable circuits, thereby

reducing the circuit attenuation over the v-f band. The TA-58/FT is used for H-88 loading on non-phantom cable pairs.

TECHNICAL CHARACTERISTICS

Inductance per unit: 88 mh.
 Cut-off frequency: 3,500 cps.
 Normal impedance: 1,000 ohms.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	85	104
Total volume (cu ft).....	.81	6
Ship tons.....		.15

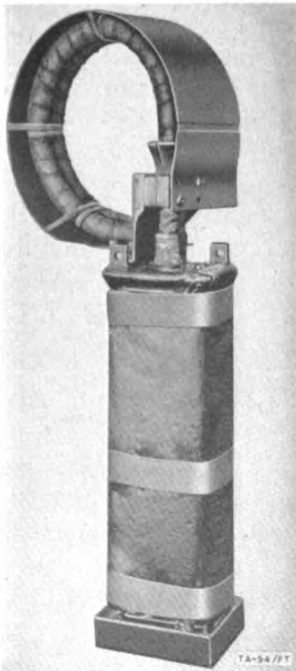


Figure 160. Loading Coil Case TA-94/FT.

Status: Limited/Std. *Stock No.:* 4B330-7.

Loading Coil Case TA-94/FT is a coil assembly inclosed in a welded-steel case. It is composed of seven phantom loading units and is intended for installation on a manhole floor. The TA-94/FT is issued equipped with a 10-foot #19 AWG cable stub.

Loading Coil Case TA-94/FT is designed to increase the transmission range of the telephone cable by inserting lumped inductance at predetermined points in the side circuits and in the phantom circuits of lead-sheathed telephone cables when that cable is being used for transmission of v-f currents and by making use of phantom and side circuits to derive the maximum number of telephone channels from available cable pairs. The TA-94/FT is used for H-88-50 loading on phantomed cable pairs.

TECHNICAL CHARACTERISTICS

INDUCTANCE PER UNIT FOR:

Side circuit: 88 mh.
Phantom circuit: 50 mh.

CUT-OFF FREQUENCY OF:

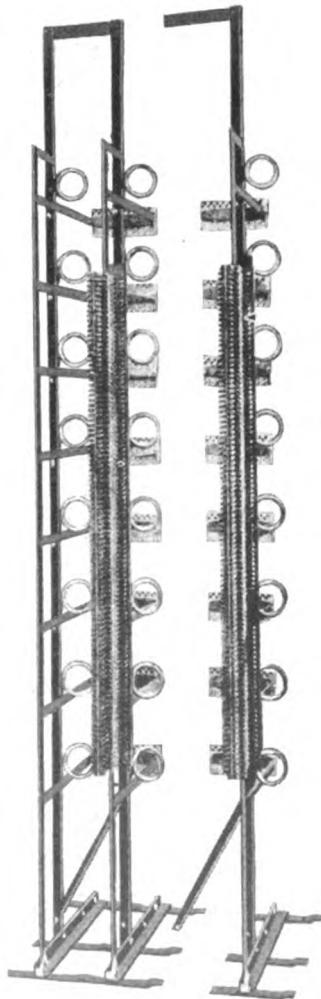
Side circuit: 4,000 cps.
Phantom circuit: 4,200 cps.

Nominal impedance:

Side circuit: 1,000 ohms.
Phantom circuit: 600 ohms.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	270	450
Total volume (cu ft).....	1.75	15
Ship tons.....		.375



TA-98/FT

Figure 161. Distribution Frame TA-98/FT.

Status: Standard. *Stock No.:* 4E2525C.

Distribution Frame TA-98/FT is an angle-iron framework which makes up a main distributing frame of the commercial B type. The vertical side is equipped with fanning strips and will accommodate four each WEC_o 1268A protector groups and one each WEC_o 1268B protector group. The horizontal side will accommodate eight horizontal rows of WEC_o 65 terminal strips. Protector groups and terminal strips must be ordered separately. The TA-98/FT is floor-mounted and two verticals of frames are required for an initial installation. Additional frames may be added as requirements increase.

Distribution Frame TA-98/FT is used to provide an interconnecting point between the outside plant and the inside plant equipment. It also furnishes protection against voltage or current surges. The TA-98/FT is used with fixed-plant telephone switchboards in permanent or semi-permanent telephone systems at depots, posts, camps, or stations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE PROTECTION:

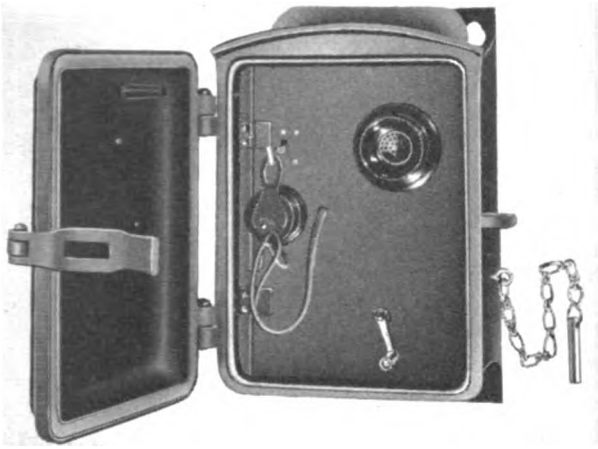
Current: Heat coils WEC_o 76A.
Voltage: Protector block WEC_o 26-27.

NUMBER OF PROTECTED PR: 100.

INTERCONNECTION OF FRAME AND SWITCHBOARD: Inside central office cable; must be ordered separately.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	180	305
Total volume (cu ft).....	9.5	15
Ship tons.....		.37



TA-100/FTC

Figure 162. Telephone TA-100/FTC.

Status: Limited/Std. Stock No.: 4B5383. Reference: TM 11-474.

Telephone TA-100/FTC is a wall type, self-contained, magneto telephone, which is inclosed in a ventilated cast-iron housing and is equipped with a waterproof locking door.

Telephone TA-100/FTC is intended for use out of doors as military police or guard call boxes, fire-alarm call boxes, or for use in any place where the telephone set is exposed to weather or rough usage.

TECHNICAL CHARACTERISTICS

RANGE:

Talking: 30-db net loss circuit.

Ringing: Line resistance 3,000 ohms; leakage resistance 1,000 ohms.

SIGNALING: Hand generator.

DIMENSIONS

Height (in.)	Width (in.)	Depth (in.)
14 $\frac{1}{8}$	11 $\frac{1}{8}$	10 $\frac{1}{4}$

Note. Not shipped separately.



TA-101/FTC

Figure 163. Telephone TA-101/FTC.

Status: Limited/Std. Stock No.: 4B5420. Reference: TM 11-474.

Telephone TA-101/FTC is a cradle type desk telephone, self-contained and intended for indoor use. The TA-101/FTC includes a plastic base, bells, induction coil, capacitors, cords, terminal blocks, transmitter, and receiver. It is convertible from manual to dial operation by the addition of a dial. The TA-101/FTC uses metallic ringing and includes an antisidetone circuit.

Telephone TA-101/FTC is used in fixed-plant, manual or automatic dial telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

RANGE: 30-db wire facility.

IMPEDANCE AT 1,000 CPS: 550 / 30°.

TRANSMISSION LOSSES FOR 48 v, 400 OHMS IN CENTRAL OFFICE:

Loop resistance (ohms)	Losses (db)
400-600	1
600-800	2
800-1,000	3

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
6	5 $\frac{1}{4}$	5 $\frac{1}{4}$	8 $\frac{1}{4}$

Length of handset is 9 in.



Figure 164. Telephone TA-102/FTC.

Status: Limited/Std. Stock No.: 4B5452. Reference TM 11-474.

Telephone TA-102/FTC is a cradle type desk telephone, self-contained and designed for indoor use. The TA-102/FTC includes a plastic base, bells, induction coil, capacitors, cords, terminal blocks, transmitter, and receiver. It is convertible from manual to dial operation by the addition of a dial. The TA-102/FTC uses metallic ringing and includes an antisidetone circuit.

Telephone TA-102/FTC is used in fixed-plant, manual or automatic dial telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

RANGE: 30-db wire facility.

IMPEDANCE AT 1,000 CPS: 550 / 30°.

TRANSMISSION LOSSES FOR 48 v, 400 OHMS IN CENTRAL OFFICE:

Loop resistance (ohms)	Losses (db)
400-600	1
600-800	2
800-1,000	3

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
6.5	5¼	6	9¼

Length of handset is 9 in.



Figure 165. Telephone TA-103/FTC.

Status: Limited/Std. Stock No.: 4B6552. Reference: TM 11-474.

Telephone TA-103/FTC is a cradle type desk telephone, self-contained and designed for indoor

use. The TA-103/FTC includes a plastic base, bells, induction coil, capacitor, cords, terminal blocks, transmitter, and receiver. It is convertible from manual to dial operation by the addition of a dial. The TA-103/FTC uses metallic ringing and includes an antisidetone circuit.

Telephone TA-103/FTC is used in fixed-plant, manual or dial automatic telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

RANGE: 30-db wire facility.

IMPEDANCE AT 1,000 CPS: 550 / 30°.

TRANSMISSION LOSSES FOR 48 v, 400 OHMS IN CENTRAL OFFICE:

Loop resistance (ohms)	Losses (db)
400-600	1
600-800	2
800-1,000	3

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
6	5¼	5¼	8

Length of handset is 9 in.



Figure 166. Telephone TA-104/FTC.

Status: Limited/Std. Stock No.: 4B5496. Reference: TM 11-474.

Telephone TA-104/FTC is a hanging type set

intended for installation on a wall or on the side of a desk. It contains a transmitter, a receiver, and a hookswitch; it is not a complete telephone by itself. Auxiliary equipment containing an induction coil, a ringer, and capacitors is necessary to make up a complete telephone. The TA-104/FTC can be used in automatic dial systems by the addition of a dial to the set.

Telephone TA-104/FTC is intended for use in fixed-plant, manual or dial automatic telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

DEPENDENT ON AUXILIARY EQUIPMENT USED. AUXILIARY EQUIPMENTS THAT CAN BE USED WITH THIS TELEPHONE ARE:

Bell box WEC_o 584-A-3 (sidetone); 684-A-3 (antisidetone).

Bell box Kellogg 602 (sidetone); 610 (antisidetone).

Bell box Auto Elec 32 (antisidetone).

Bell box St Carl 1156-A (antisidetone).

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
2.6	4 $\frac{3}{16}$	2 $\frac{2}{16}$	4 $\frac{1}{16}$

Length of handset is 9 in.

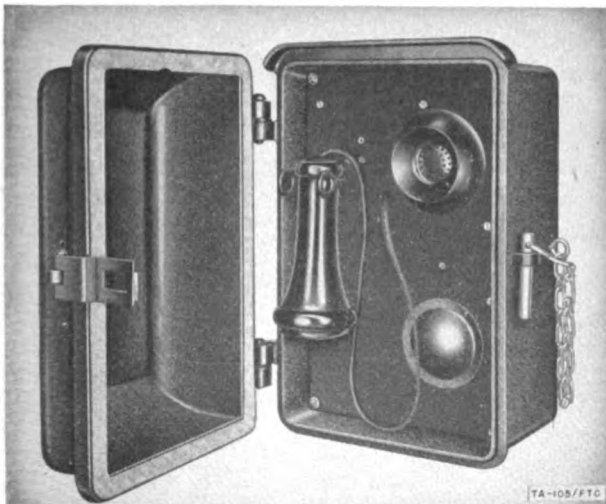


Figure 167. Telephone TA-105/FTC.

Status: Standard. Stock No.: 4B5669.1A. Reference: TM 11-474.

Telephone TA-105/FTC is a wall type, self-contained, common battery telephone that can be converted to dial operation by the addition of a dial. The TA-105/FTC is inclosed in a ventilated cast-iron housing and is equipped with a waterproof locking door.

Telephone TA-105/FTC is intended for use out of doors as military police or guard call boxes, fire-alarm call boxes, or for use in any place where the telephone set is exposed to weather or rough usage.

TECHNICAL CHARACTERISTICS

RANGE:

Talking: 30-db net loss circuit.

Signaling: Line resistance 300 ohms; leakage resistance 10,000 ohms.

SIGNALING: Hookswitch.

AUXILIARY EQUIPMENT REQUIRED: Lightning Protection.

DIMENSIONS

Height (in.)	Width (in.)	Depth (in.)
12 $\frac{1}{4}$	9 $\frac{1}{4}$	8



Figure 168. Telephone TA-106/FTC.

Status: Limited/Std. Stock No.: 4B5721A.

Telephone TA-106/FTC is a cradle type desk telephone, intended for magneto operation and designed for indoor use. The TA-106/FTC

includes a zinc die-cast case painted black, bells, induction coil, capacitors, cords, terminal blocks, transmitter, receiver, and hand generator. It is equipped with a five-conductor extension cord and a connecting block.

Telephone TA-106/FTC is used on loops to magneto switchboards in fixed-plant telephone systems where the length of the local lines or the conditions of the outside plant prohibit the use of common battery equipment.

TECHNICAL CHARACTERISTICS

RANGE:

Talking: 30-db wire facility.

Ringing: Line without repeat coils, 3,000 ohms; line with two repeat coils, 2,000 ohms.

IMPEDANCE AT 1,000 CPS 650/30°.

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
7.4	6	5½	9

Length of handset is 9 in.



Figure 169. Telephone TA-109/FTC.

Status: Limited/Std. Stock No.: 4B6123. Reference: TM11-474.

Telephone TA-109/FTC is a wall type tele-

phone, self-contained and designed for indoor use. The TA-109/FTC includes a plastic case, bells, induction coil, capacitors, cords, terminal blocks, transmitter, and receiver. It is convertible from manual to dial operation by the addition of a dial. The TA-109/FTC uses metallic ringing and includes an antisidetone circuit.

Telephone TA-109/FTC is used when a wall type telephone is required in fixed-plant telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

RANGE: 30-db wire facility.

IMPEDANCE at 1,000 CPS: 550/30°.

TRANSMISSION LOSS FOR 48 v, 400 OHMS IN CENTRAL OFFICE:

Loop resistance (ohms)	Losses (db)
400-600	1
600-800	2
800-1,000	3

WEIGHTS AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
6	9½	5¾	5¾

Length of handset is 9 in.



Figure 170. Telephone TA-110/FTC.

Status: Limited/Std. Stock No.: 4B6303BA.1A.
Reference: TM 11-474.

Telephone TA-110/FTC is a hang-up type wall set, self-contained and designed for indoor use. The TA-110/FTC includes a plastic case, bells, induction coil, capacitors, cords, terminal blocks, transmitter, and receiver. It is convertible from manual to dial operation by the addition of a dial

(Kellogg part P-58985 and dial) which is attached to the top of the case. The TA-110/FTC uses metallic ringing and includes an antisidetone circuit.

Telephone TA-110/FTC is used when a wall telephone is required in fixed-plant, manual or automatic dial telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

RANGE: 30-db wire facility.
IMPEDANCE AT 1,000 CPS: 550/30°.
TRANSMISSION LOSSES FOR 48 v, 400 OHMS IN CENTRAL OFFICE:

Loop resistance (ohms)	Losses (db)
400-600	1
600-800	2
800-1,000	3

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
5.5	10¼	5	4¾

Length of handset is 9 in.



Figure 171. Telephone TA-114/FTC.

Status: Limited/Std. Stock No.: 4B6653A.
Reference: TM 11-474.

Telephone TA-114/FTC is a wall type telephone, self-contained and designed for indoor use. The TA-114/FTC includes a metal case with black finish, bells, induction coil, capacitors, cords, terminal blocks, transmitter, and receiver. It is convertible from manual to dial operation by the

addition of a dial (WECO type 5H). The TA-114/FTC can be used for two-party selective or four-party selective lines in either manual or dial telephone systems. It includes an antisidetone circuit.

Telephone TA-114/FTC is used when a wall type and selective type ringing telephone is required in fixed-plant telephone systems of permanent installations in base sections of a communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

RANGE: 30-db wire facility.
IMPEDANCE AT 1,000 CPS: 550/30°.
SELECTIVE RINGING: Two-party.
SEMISELECTIVE RINGING: Four-party.
TRANSMISSION LOSSES FOR 48 v, 400 OHMS IN CENTRAL OFFICE:

Loop resistance (ohms)	Losses (db)
200-600	1
600-800	2
800-1,000	3

WEIGHT AND DIMENSIONS

Weight (lb)	Height (in.)	Width (in.)	Depth (in.)
6.7	7½	5¼	3¾

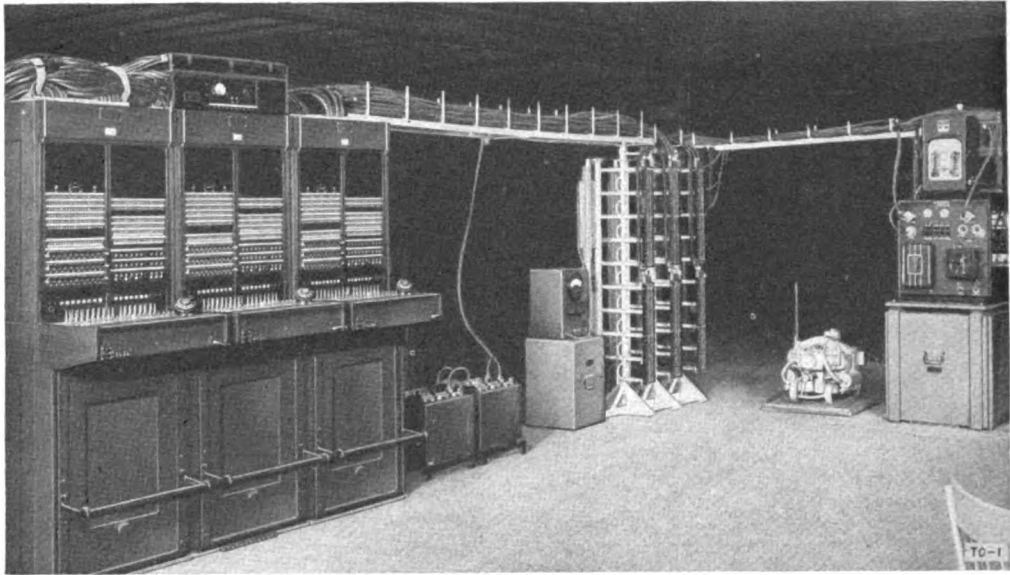


Figure 172. Telephone Central Office Set TC-1, assembled.

Status: Limited/Std. Stock No.: 4C27001. Reference: TM 11-335.

Telephone Central Office Set TC-1 is a complete, transportable, tactical telephone exchange. It can serve both common battery and magneto lines. It is arranged for handling, originating, and terminating trunk and tie line traffic. The TC-1 includes all terminating equipment, power equipment, ringing equipment, test equipment, switchboards, and accessories necessary to operate under field conditions.

Telephone Central Office Set TC-1 can be used at any headquarters that requires a telephone exchange of the capacity and capabilities of one to two Telephone Central Office Sets TC-1. Two Telephone Central Office Sets TC-1 may be multipled together to double the line, trunk, and traffic handling capacity at one installation.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 90 magneto and 180 common battery lines.

TRUNK CAPACITY:¹ 9 common battery and 9 dial trunks.

POWER SUPPLY:

Power Unit PE-75-(*): Output 2.5 kva, 115 v, 60 cyc ac.

Rectifier RA-36-(*): Output 12 amp, 0 to 65 v.

Storage Battery BB-46: Capacity 90 amp-hr; output 40 to 56 v; cells 24.

POWER CONTROL AND DISTRIBUTION:

Panel BD-90-(*): Control and connecting point for battery current supply circuits, source of ringing current and alarm panel.

Cabinet BD-75: Contains switching, protection, and connection facilities for a-c power circuits.

Cabinet BC-72: Distribution point for dc to switchboards and provides cord circuit and line circuit testing equipment.

LINE PROTECTION AND TERMINATION:

Frame FM-19: Vertical distributing frame, heat coil, and carbon block protection; 100 protected pr on ea vertical.

TESTING FACILITIES:

Wire Chief's Test Set BE-70: Can be used to test for grounds, crosses, shorts, and opens. Requires additional equipment for fault location.

¹ Magneto line circuits can be used to terminate two-way ringdown trunks.

PRINCIPAL COMPONENTS

Component	Quantity
Switchboard BD-80-(*)	3
Panel BD-90-(*)	1
Frame FM-19	3
Battery BB-46	4
Rectifier RA-36-(*)	1
Power Unit PE-75	1
Cabinet BE-75	1
Cabinet BE-72	1
Cabinet BE-70	1
Head and chest sets	6
Maintenance Equipment ME-4	1
Tool Equipment TE-44	1
Chair M-192	3
Truck, box, or case	3

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	7,900	10,596
Total volume (cu ft)		543
Ship tons		13.6

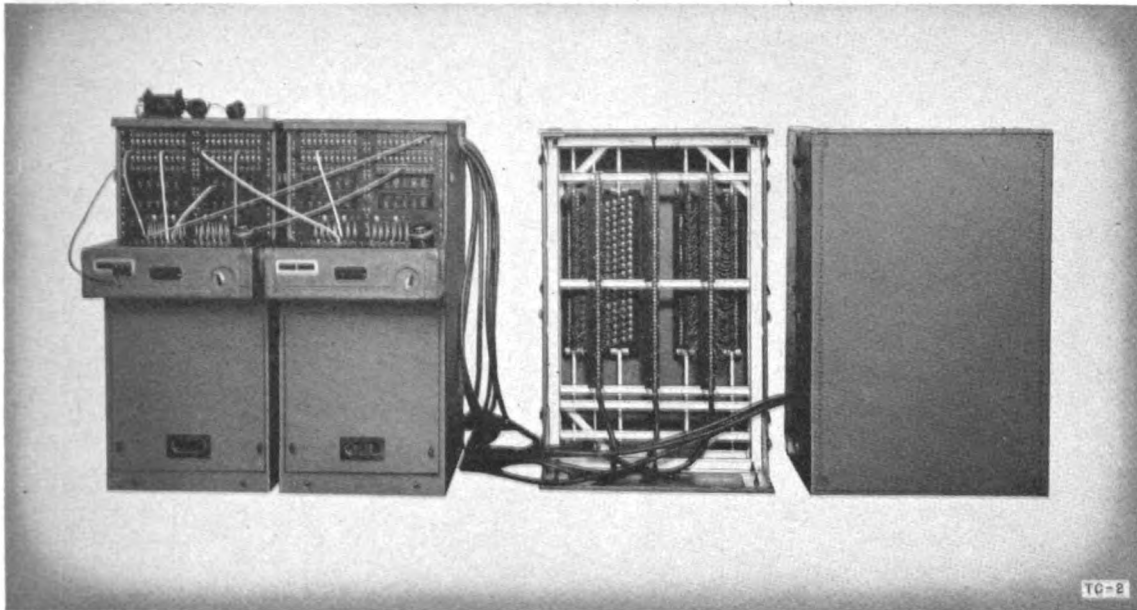


Figure 173. Main components of two Telephone Central Office Sets TC-2, set up side by side.

Status: Substitute/Std. **Stock No.:** 4C27002.
Reference: TM 11-340.

Telephone Central Office Set TC-2 is a complete, transportable, tactical telephone exchange. It can serve both common battery and magneto lines. It is arranged for handling, originating, and terminating trunk and tie line traffic. The TC-2 includes all terminating equipment, power equipment, ringing equipment, test equipment, switchboard, and accessories necessary for operation under field conditions.

Telephone Central Office Set TC-2 can be used at any headquarters that requires a telephone exchange of the capacity and capabilities of one or two Telephone Central Office Sets TC-2. Two Telephone Central Office Sets TC-2 may be used side by side to double the line, trunk, and traffic handling capacity at one installation.

TECHNICAL CHARACTERISTICS

LINE CAPACITY:¹ 20 magneto and 37 or 40 common battery lines.

TRUNK CAPACITY:² 2 common battery and 1 dial trunk or 4 universal trunks.

POWER SUPPLY:

Power Unit PE-75-(*): Output 2.5 kva, 115 v, 60 cyc ac.

Rectifier RA-36-(*): Output 12 amp, 0 to 65 v.

Storage Battery BB-46: Capacity 90 amp-hr; output 22 to 30 v; cells 12.

POWER CONTROL AND DISTRIBUTION:

Panel BD-98: Control and connecting point for battery current supply circuits, source of ringing current.

Cabinet BE-75: Contains switching, protection, and connection facilities for a-c power circuits.

LINE PROTECTION AND TERMINATION:

Cabinet BE-79: Cabinet type MDF, heat coil, and carbon block protection; 80 protected pr in cabinet.

TESTING FACILITIES:

Wire chief's Test Set BD-70-B: Can be used to test for grounds, crosses, shorts, and opens. Requires additional equipment for fault location

¹ Depends on model of Switchboard BD-89 used.

² Magneto line circuits can be used to terminate two-way ringdown trunks.

PRINCIPAL COMPONENTS

Component	Quantity
Switchboard BD-89-(*)	1
Panel BD-98	1
Cabinet BE-79	1
Battery BB-46	2
Rectifier RA-36-(*)	1
Power Unit PE-75-(*)	1
Cabinet BC-75	1
Headset HS-30	3
Chest Set TS-1	3
Microphone T-45	2
Chair M-205	1
Maintenance Equipment ME-6	1
Tool Equipment TE-44-A	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	2,900	3,412
Total volume (cu ft)		146
Ship tons		3.6

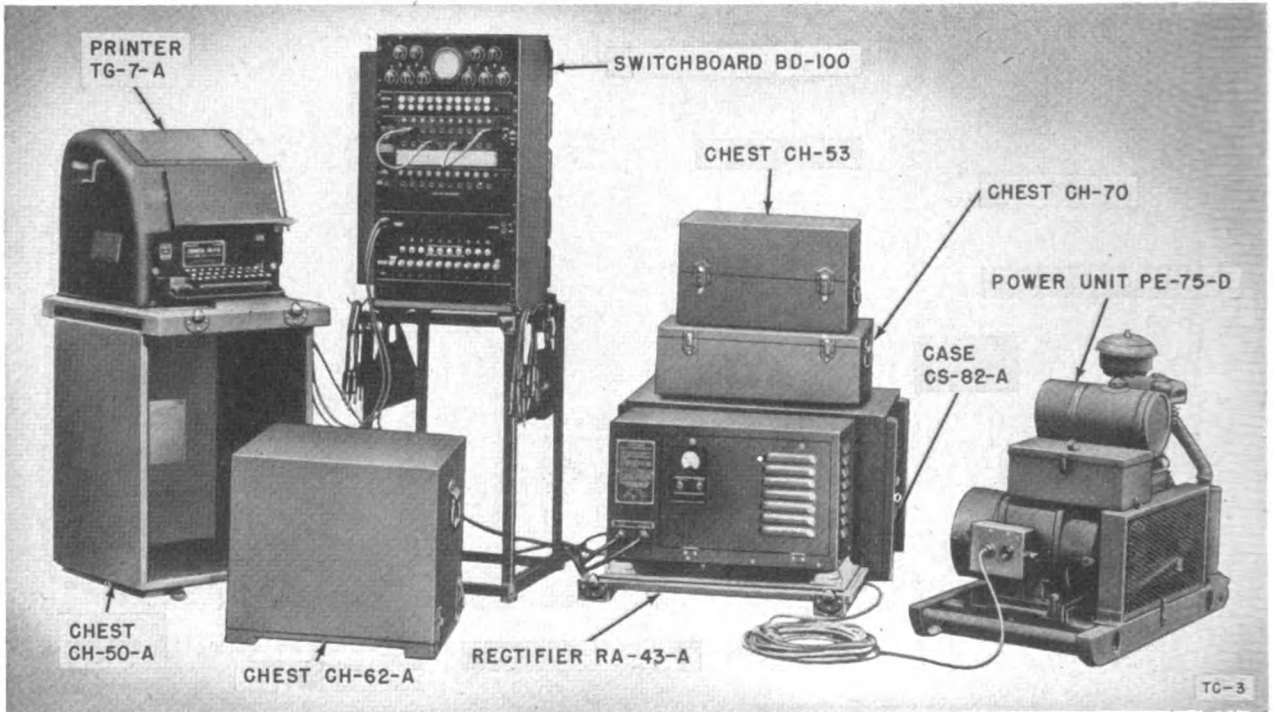


Figure 174. Telegraph Central Office Set TC-3.

Status: Standard. Stock No.: 4A2788. Reference: TM 11-358.

Telegraph Central Office Set TC-3 is a complete, transportable, teletypewriter switching center. It provides switching facilities for teletypewriter line circuits. Patching cords are provided for the interconnection of the teletypewriter circuits, and a teletypewriter set is used for answering and supervising calls through the switchboard. The Telegraph Switchboard BD-100, major component of Telegraph Central Office Set TC-3, similar to a telephone switchboard, makes it possible to interconnect any one of several stations with any one or more stations connected to the same switchboard.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 10 ground-return or metallic, neutral type line circuits.

POWER SUPPLY:

Power Unit PE-75-(*): Output 2.5 kva, 115 v, 60 cyc ac.

Rectifier RA-43-(*): Output .5 to 4.5 amp, 120 v dc.

LINE PROTECTION AND TERMINATION:

Integral: Fuses, 10 protected pr per switchboard.

PRINCIPAL COMPONENTS

Component	Quantity
Switchboard BD-100	1
Printer TG-7-A or Teletypewriter TG-7-B	1
Rectifier RA-43-(*)	1
Power Unit PE-75-(*)	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	1, 155	1, 683
Total volume (cu ft)	44	93. 3
Ship tons		2. 4

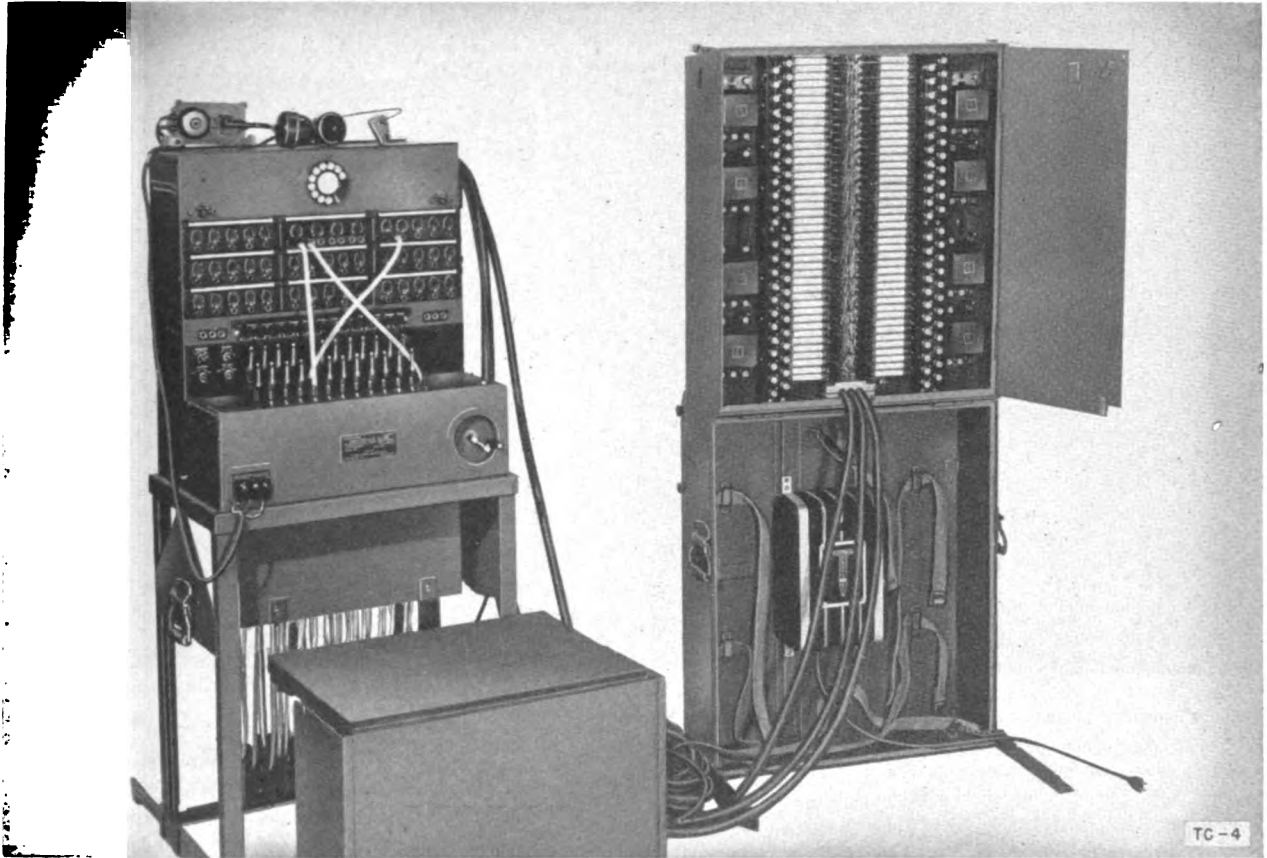


Figure 175. Telephone Central Office Set TC-4.

Status: Standard. *Stock No.:* 4C27004. *Reference:* TM 11-332.

Telephone Central Office Set TC-4 is a complete, transportable, tactical telephone switching central. It is a single-position, nonmultiple, manually operated telephone central office designed for use primarily in field wire systems. It can be used for handling magneto line calls and for originating and terminating manual common battery, automatic (dial), and ringdown tie line traffic.

The main distributing frame is especially designed for use with the switchboard. It furnishes line protection and termination for circuits connected through to the telephone switchboard. Telephone Central Office Set TC-4 is used at a Division Headquarters. It may be used at any headquarters that requires a telephone switching center of the capacity and capabilities of the TC-4.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 40 magneto lines.
TRUNK CAPACITY: 4 universal trunks.

POWER SUPPLY:

Battery BA-30, 6 ea: 2 batteries, 3 v, first operator's telephone circuit; 2 batteries, 3 v, second operator's telephone circuit; 2 batteries, 3 v, operation of night-alarm buzzer.

Battery BA-23, 2 ea: Operation of Converter M-222.

LINE PROTECTION AND TERMINATION:

Panel BD-97: Panel type MDF, fuses, and carbon block protection; 44 protected pr per panel; 8 Coil C-161 attached to panel but not connected into the line circuits.

PRINCIPAL COMPONENTS

Component	Quantity
Switchboard BD-96	1
Panel BD-97	1
Headset H-30	2
Chest Set H-18/GT or TD-1	2
Microphone T-45	1
Converter M-222	1
Maintenance Equipment ME-11	1
Telephone EE-8-(*)	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	590	650
Total volume (cu ft)		21
Ship tons		.5

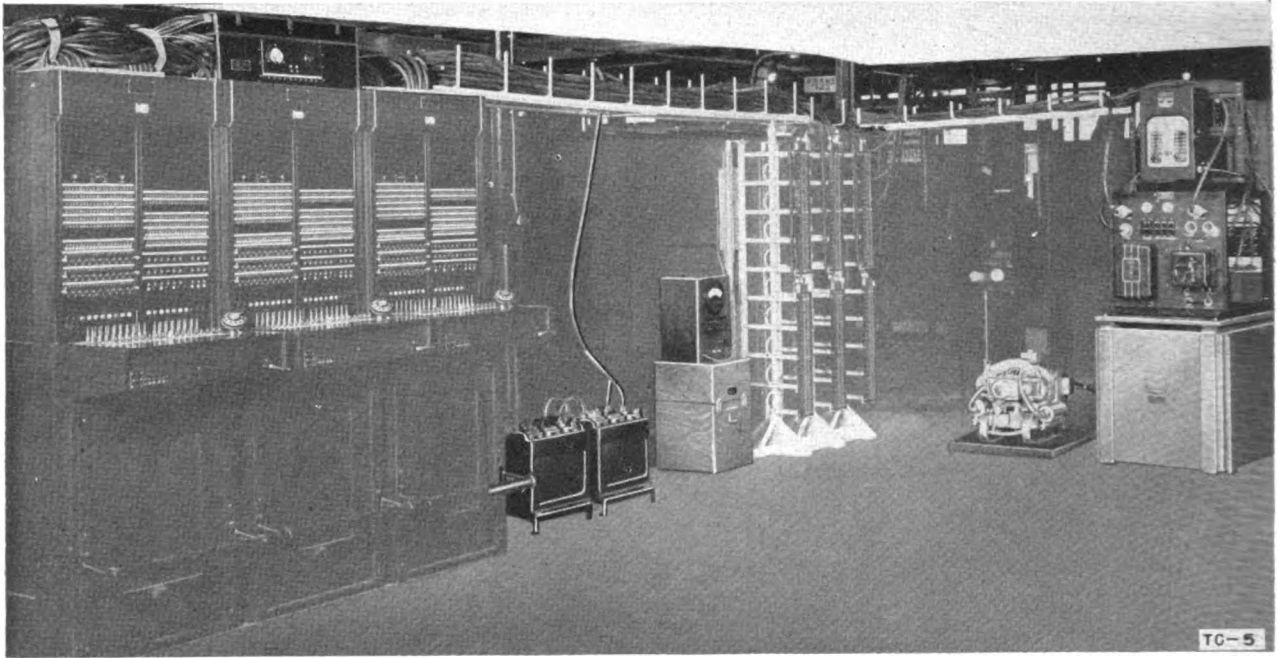


Figure 176. Telephone Central Office Set TC-5.

Status: Limited/Std. *Stock No.:* 4C27005.

Telephone Central Office Set TC-5 is a complete set of supplemental equipment that permits establishing a separate telephone central office when Switchboard BD-80 or BD-110, with its associated Frame FM-19, can be borrowed from Telephone Central Office Set TC-1 or TC-10.

TECHNICAL CHARACTERISTICS

POWER SUPPLY:

Power Unit PE-75-(*): Output 2.5 kva, 115 v, 60 cyc ac.

Rectifier RA-36-(*): Output 12 amp, 0 to 65 v.

Storage Battery BB-46: Capacity 90 amp-hr; output 40 to 56 v; cells 24.

POWER CONTROL AND DISTRIBUTION:

Panel BD-90-(*): Control and connecting point for battery current supply circuits, source of ringing current and alarm panel.

Cabinet BE-75: Contains switching, protection, and connection facilities for a-c power circuits.

Cabinet BE-72: Distribution point for dc to switchboards and provides cord circuit and line circuit testing equipment.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Panel BD-90-(*)	1
Battery BB-46	4
Rectifier RA-36-(*)	1
Power Unit PE-75-(*)	1
Cabinet BE-75	1
Cabinet BE-72	1
Tool Equipment TE-44	1
Case CS-61	1
Case CS-63	4
Case CS-72	1
Case CS-73	1

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)	1,601	2,531
Total volume (cu ft)		149
Ship tons		3.7

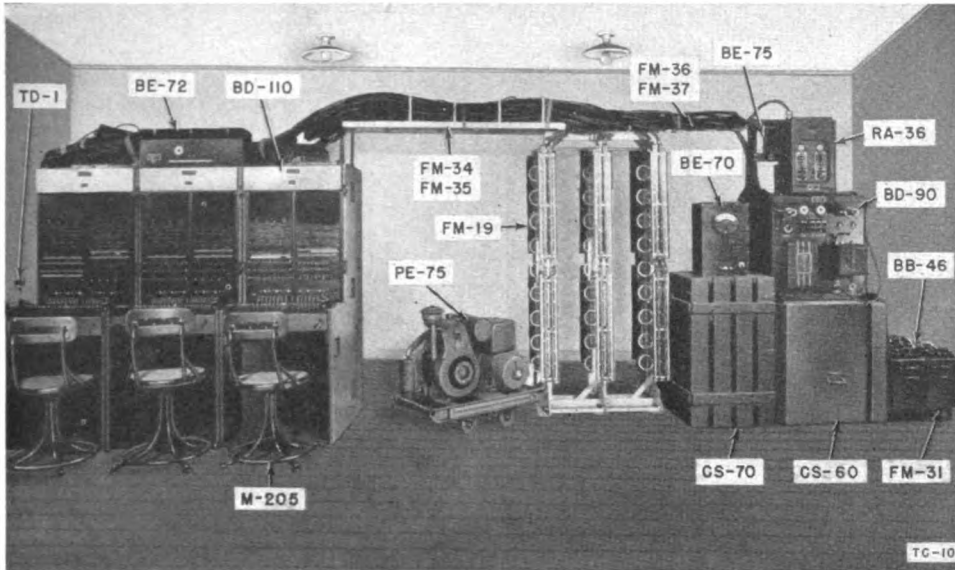


Figure 177. Telephone Central Office Set TC-10, assembled.

Status: Substitute/Std. **Stock No.:** 4C27010.
Reference: TM 11-338.

Telephone Central Office Set TC-10 is a complete, transportable, tactical telephone exchange. It can serve both common battery and magneto lines. It is arranged for handling, originating, and terminating trunk and tie line traffic. The TC-10 includes all terminating equipment, power equipment, ringing equipment, test equipment, switchboards, and accessories necessary to operate under field conditions.

Telephone Central Office Set TC-10 can be used at any headquarters that requires a telephone exchange of the capacity and capabilities of one to two Telephone Central Office Sets TC-10. Two Telephone Central Office Sets TC-10 may be used together to double the line, trunk, and traffic handling capacity at one installation.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 90 magneto and 180 common battery lines.

TRUNK CAPACITY:¹ 12 universal trunks.

POWER SUPPLY:

Power Unit PE-75-(*): Output 2.5 kva, 115 v, 60 cycle ac.

Rectifier RA-91: Output 12 amp, 0 to 65 v.

Storage Battery BB-46: Capacity 90 amp-hr; output 40 to 56 v; cells 24.

POWER CONTROL AND DISTRIBUTION:

Power Panel BD-132: Control and connecting point for battery current supply circuits, source of ringing current and alarm panel.

Cabinet BE-75: Contains switching, protection, and connection facilities for a-c power circuits.

Cabinet BE-72: Distribution point for dc to switchboards and provides cord circuit and line circuit testing equipment.

Line protection and termination:

Frame FM-19: Vertical distributing frame, heat coil, and carbon block protection; 100 protected pr on ea vertical.

Testing facilities:

Testboard BD-101: Can be used to test for grounds, crosses, shorts, and opens. Requires additional equipment for faulty location.

¹ Magneto to line circuits can be used to terminate two-way ringdown trunks.

PRINCIPAL COMPONENTS

Component	Quantity
Switchboard BD-110-(*)	3
Panel BD-90-(*)	1
Frame FM-19	3
Battery BB-46	4
Rectifier RA-36-(*)	1
Power Unit PE-75-(*)	2
Cabinet BE-72	1
Cabinet BE-70	1
Headset HS-30	6
Chest Set H-18/GT	6
Maintenance Equipment ME-44	1
Tool Equipment TE-44	1
Chair M-205	3
Truck, box or case	3

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	7,900	10,596
Total volume (cu ft)		543
Ship tons		13.6

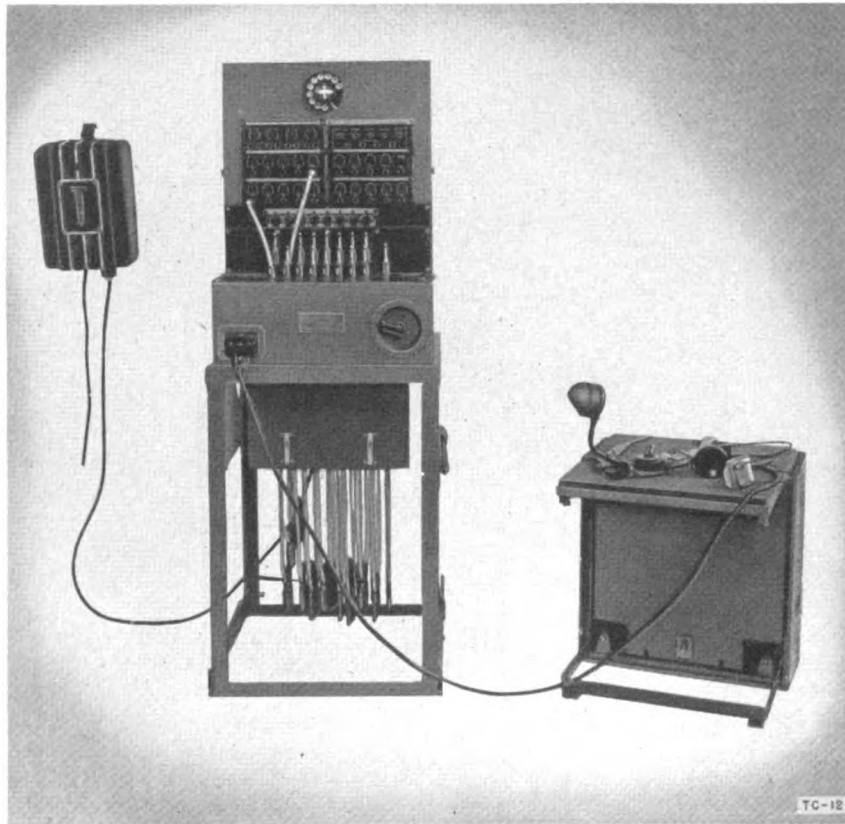


Figure 178. Telephone Central Office Set TC-12.

Status: Standard. Stock No.: 4C27012. Reference: TM 11-336.

Telephone Central Office Set TC-12 is a complete, transportable, tactical telephone central. It is a single-position, nonmultiple, manually operated telephone central designed for use primarily in field wire systems. The TC-12 can be used for handling magneto line calls, and for originating and terminating manual common battery, automatic (dial), and ringdown tie line traffic.

Telephone Central Office Set TC-12 is housed in a steel cabinet contained in an angle-iron frame which is used as a base when set up for operation. The TC-12 can be used at any headquarters that requires a switching central of the capacity and capabilities of the Telephone Central Office Set TC-12.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 20 magneto lines.
TRUNK CAPACITY: 4 universal trunks.

POWER SUPPLY:

Battery BA-30, 8 ea: 2 batteries, 3 v, first operator's telephone circuit; 2 batteries, 3 v, second operator's telephone circuit; 4 batteries, 3 v, series-parallel combination for operation of night-alarm buzzer.

Battery BA-23, 2 ea: Operation of Converter M-222.

LINE PROTECTION AND TERMINATION:

Integral: Fuses and carbon block protection, 24 protected pr; 40 Coils C-161 permanently connected through protectors to the first 4 sets of line binding posts.

PRINCIPAL COMPONENTS

Component	Quantity
Switchboard BD-91 -(*)	1
Chest Set H-18/GT or Chest Set TD-1	2
Headset HS-30	2
Telering PE-250	1
Microphone T-45	2
Set of switchboard tools	1
Converter M-222	1
Ground Rod MX-148/G	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	215	380
Total volume (cu ft)	4.5	12
Ship tons		.3

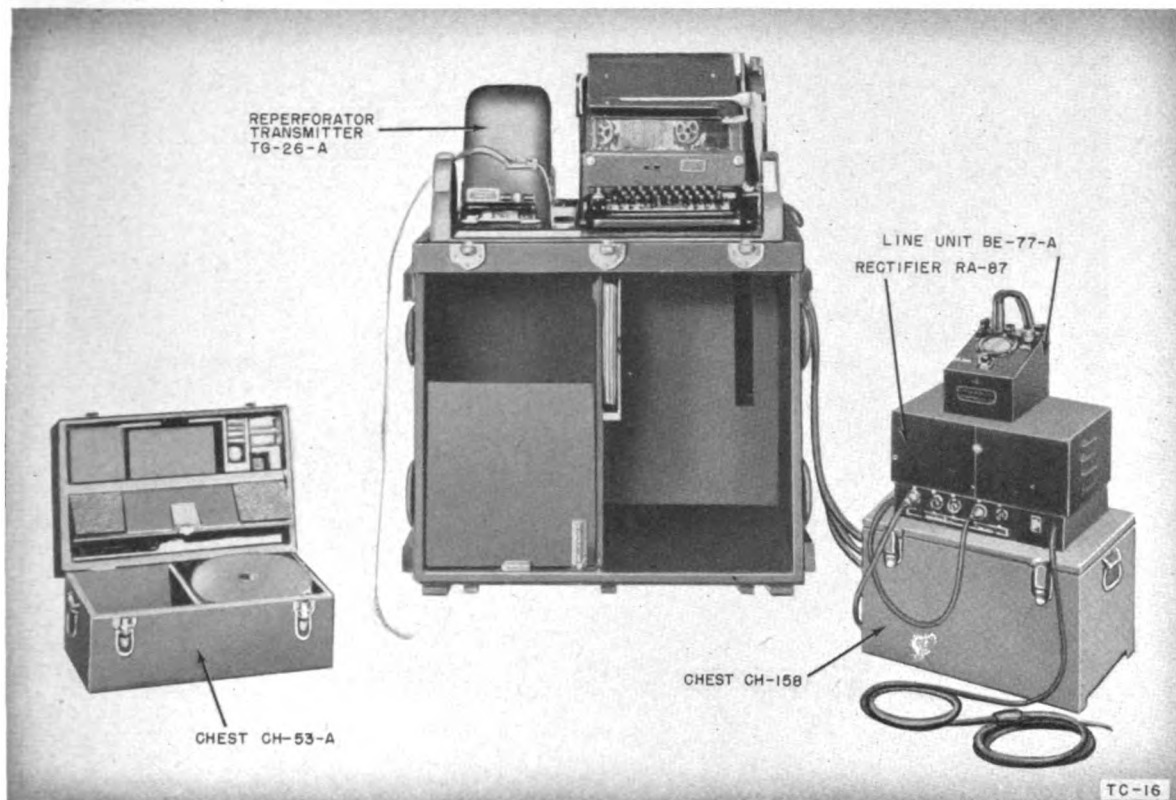


Figure 179. Reperforator Teletypewriter Set TC-16.

Status: Standard. *Stock No.:* 4TTC16. *Reference:* TM 11-2201.

Reperforator Teletypewriter Set TC-16 provides complete, portable, sending, and receiving teletypewriter stations for field or station use. This set consists essentially of a typing reperforator, a keyboard, and a transmitter distributor adapted for use on a 60-ma neutral type network or for point-to-point communication. Provision is made for operating the set in conjunction with Telegraph Printer Sets EE-97, EE-98, EE-102, and Telegraph Central Office TC-3.

Reperforator Teletypewriter Set TC-16 uses Reperforator Transmitter TG-26-A which has a standard communication keyboard and type-bar symbols. Except for the differences in the reperforator keyboards, type-bar symbols, and end-of-line mechanism adjustments for the reperforators, Reperforator Teletypewriter Sets TC-16 and TC-17 are alike. Major components of the sets are interchangeable.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 2 sending and receiving circuits
60-ma neutral type.

POWER SUPPLY:

Required: 115/230 v, 50 to 60 cyc ac.

Rectifier RA-87-(*): Output .4 amp, 115 v dc, 46 w; 4.35 amp, 115 v ac, 500 w.

SPEED OF OPERATION: 60 wpm (368 opm). 66 wpm (404 opm).

LINE PROTECTION AND TERMINATION:

Line Unit BE-77-A: Makes necessary connections between d-c power source, line circuit, and teletypewriter equipment. Repeats signals transmitted to and received from line. Measures and adjusts line current; adjusts quality (bias) of the received signals. Measures voltage of the d-c power source and bias in line signal; provides fuse protection.

PRINCIPAL COMPONENTS

Component	Quantity
Reperforator Transmitter TG-26-A, complete in carrying case.....	1
Rectifier RA-87, complete in chest.....	1
Line Unit BE-77-A with group of accessories and spare parts.....	1
Ground Rod MX-148/G.....	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	331	587
Total volume (cu ft).....	15	33
Ship tons.....		.8

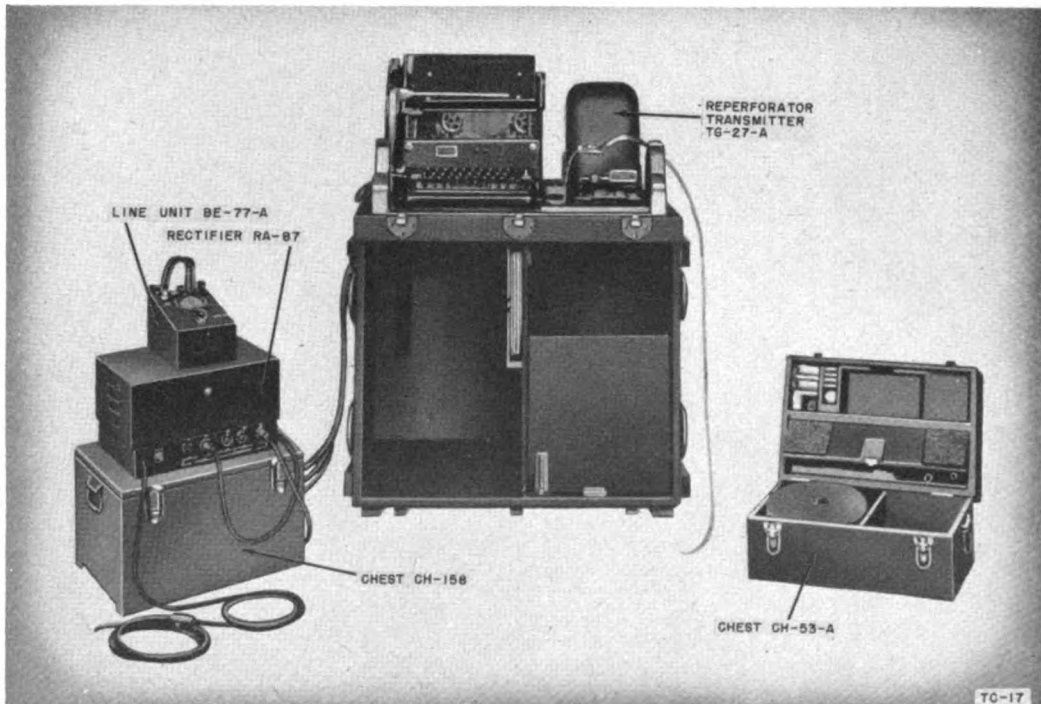


Figure 180. Reperforator Teletypewriter Set TC-17.

Status: Standard. *Stock No.:* 4TT17. *Reference:* TM 11-2201.

Reperforator Teletypewriter Set TC-17 provides complete, portable, sending and receiving teletypewriter stations for field or station use. This set consists essentially of a typing reperforator, a keyboard, and a transmitter distributor adapted for use on 60-ma neutral type networks or for point-to-point communication. Provision is made for operating the set in conjunction with Teletypewriter Set EE-102 and Telegraph Central Office Set TC-3.

Reperforator Teletypewriter Set TC-17 uses Reperforator Transmitter TG-27-A, which has reperforator keyboard and type-bar symbols for communication and weather information. Except for the difference in the reperforator keyboards, type-bar symbols, and end-of-line mechanism adjustments for the reperforators, Reperforator Teletypewriter Sets TC-17 and TC-16 are alike. Major components of the sets are interchangeable. Reperforator Teletypewriter Set TC-17 was designed for use in weather information nets of the Air Forces and the Ground Forces, at the higher tactical levels.

TECHNICAL CHARACTERISTICS

LINE CAPACITY: 2 sending and receiving circuits, 60-ma neutral type

POWER SUPPLY:

Required: 115 or 230 v, 50 to 60 cyc ac.

Rectifier RA-87-(*): Output .4 amp, 115 v dc, 45 w; 4.35 amp, 115 v ac, 500 w.

SPEED OF OPERATION: 60 wpm (368 opm); 66 wpm (404 opm).

LINE PROTECTION AND TERMINATION:

Line Unit BE-77-A: Makes necessary connections between d-c power source, wire line circuit, and teletypewriter equipment. Repeats signals transmitted to and received from line. Measures and adjusts line current; adjusts quality (bias) of the received signals. Measures voltage of the d-c power source and bias in line signal; provides fuse protection.

PRINCIPAL COMPONENTS

Component	Quantity
Reperforator Transmitter TG-27-A, complete in case	1
Rectifier RA-87-(*), complete in chest	1
Line Unit BE-77-A with group of accessories and spare parts	1
Ground Rod MX-148/G	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	331	587
Total volume (cu ft)	15	33
Ship tons		.8

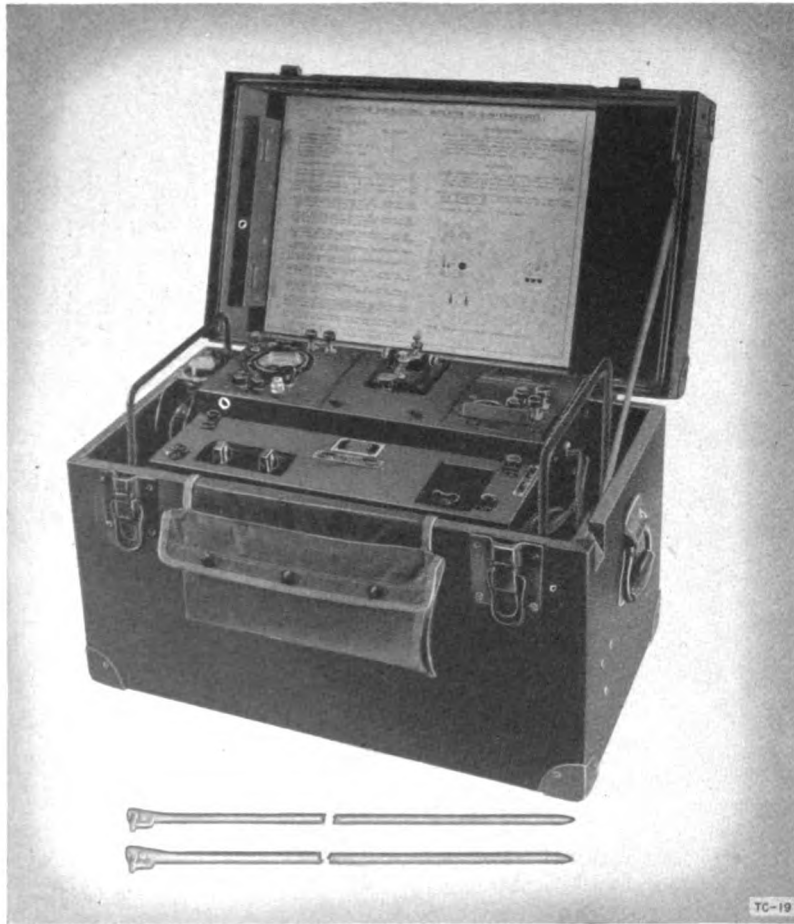


Figure 181. Repeater Set TC-18, Terminal Telegraph Repeater.

Status: Standard. *Stock No.:* 4A2118. *Reference:* TM 11-2004.

Repeater Set TC-18 is a portable, d-c, terminal telegraph repeater set designed for transmitting to and receiving from another Repeater Set TC-18, or its equivalent, at a distant terminal on a half-duplex basis, either with or without an intermediate telegraph repeater at one intermediate point.

Repeater Set TC-18 provides one channel for telegraph (teletypewriter) communication. It can be used to interconnect neutral and polarential or two-path polar telegraph or teletypewriter systems. It is used on simplex or composited ground-return circuits. By the use of Repeater Set TC-18, the normal operating range of teletypewriter equipment, for a given wire facility, can be approximately doubled.

TECHNICAL CHARACTERISTICS

LINE SIDE:

Operation: Polarential (1 telegraph circuit) polar send; differential send; two-path polar (2 telegraph circuit).

LOCAL SIDE:

Operation: 30- or 60-ma neutral type circuit.

SPEED OF:

Operation: 60 speed (368 opm); 66 speed (404 opm).

POWER SUPPLY:

Required: 115 or 230 v, 50 to 60 cyc ac or 115 v dc (The d-c power supply should be ungrounded.)

LINE PROTECTION: Carbon block line protectors.

PRINCIPAL COMPONENTS

Component	Quantity
Repeater TG-30, terminal telegraph	1
Ground Rod MX-148/G	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	146	195
Total volume (cu ft)	3.4	6.5
Ship tons		.2



Figure 182. Repeater Set TC-19, Intermediate Telegraph Repeater.

Status: Standard. Stock No.: 4A2119. Reference: TM 11-2005.

Repeater Set TC-19 is a portable, d-c, telegraph repeater set for use at an intermediate point located between terminal repeaters. Repeater Set TC-19 is designed to repeat the telegraph signal in either direction, but not in both directions at the same time. The distant terminal repeaters should be Repeater Set TC-18 or its equivalent. Only one Repeater Set TC-19 can be used in the line circuit between two terminal repeaters.

Repeater Set TC-19 provides one channel for telegraph (teletypewriter) communication, and it is used at an intermediate point on a simplex or composited ground-return telegraph (teletypewriter) circuit. By the use of Repeater Set TC-19 (intermediate telegraph), the operating range of Repeater Set TC-18 (terminal telegraph) can be approximately doubled for a given wire facility.

TECHNICAL CHARACTERISTICS

LINE SIDE:

Operation: Receives polarential-polar; transmits polarential-differential.

LOCAL SIDE:

Operation: Arranged for connection of teletypewriter set that can be used as an intermediate station or as a monitoring set.

SPEED OF:

Operation: 60 speed (368 opm); 66 speed (404 opm).

POWER SUPPLY:

Required: 115 or 230 v, 50 to 60 cyc ac or 115 v dc, gasoline-engine power unit or dry batteries, or 12-v storage battery, BB-55, or equivalent. (The d-c power supply should be ungrounded.)

LINE PROTECTION: Carbon block line protection.

PRINCIPAL COMPONENTS

Component	Quantity
Repeater TG-31, intermediate telegraph	1
Ground Rod MX-148/G	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	136	185
Total volume (cu ft)	3.4	6.5
Ship tons		.2

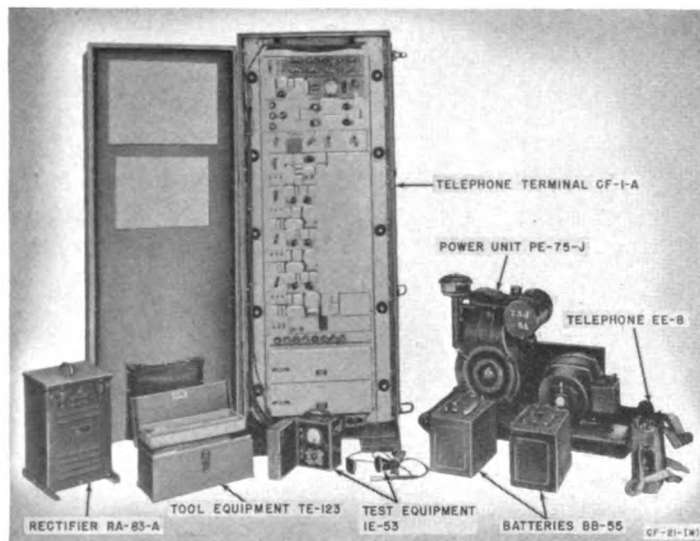


Figure 183. Telephone Terminal Set TC-21.

Status: Standard. **Stock No.:** 4B8360-21. **Reference:** TM 11-341.

Telephone Terminal Set TC-21-(*) represents TC-21-A and TC-21-B. Telephone Terminal Set TC-21-(*) is a complete, transportable, telephone carrier terminal used in tactical, telephone communication systems. It is a 4-channel carrier telephone terminal designed for use on spiral-four cable to provide high quality long distance communication. The spiral-four cable must be terminated at the distant end in another Telephone Terminal Set TC-21-(*).

The CF-1-A or CF-1-B, which is the major component of the TC-21-(*), provides amplification for v-f channel 1, and generates three-carrier frequencies which feed modulators and demodulators to produce superimposed transmission in channels 2, 3, and 4. Lower side bands only are admitted to the transmission line (upper side band and carrier are suppressed). The four channels occupy the 0- to 12-kc band. Telephone Terminal Set TC-21-(*) is part of Carrier System AN/TCC-2.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normal output is 0 dbm, may be raised to +5 or +10 dbm.

LOCATION IN SYSTEM: At terminating ends of spiral-four systems.

RANGE MAXIMUM: ¹ 150 mi on ground or in air, 450 mi when cable is buried.

POWER REQUIREMENTS: 115 or 230 v, 50 to 60 cycle ac, or 20-v storage battery.

NORMAL A-C POWER CONSUMPTION: 61 w.

STAND-BY POWER, CONSUMPTION-CAPACITY:

2 Battery BB-55, 7.5 amp, 20 hr.

TUBE COMPLEMENT: 10 ea 6SJ7, 2 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at cable binding post.

MONITORING: EE-8 with CF-1-A Handset with CF-1-B.²

SIGNAL LEVEL INDICATION: Dbm meter and 1,000-cycle tone source.³

HOUSING: Rack and panels mounted in wooden case.

CARRIER FREQUENCIES: Channel 2 — 5,900 cps; Channel 3 — 8,850 cps; Channel 4 — 11,800 cps.

LINE TERMINATIONS: 4-wire only (600-ohm impedance).

DROP AND LOOP TERMINATIONS: 2-wire drop on CF-1-A; 2- or 4-wire drop on CF-1-B.²

SIGNAL AND ALARM CIRCUIT: Uses one of the simplex circuits.

¹ Max ranges given, assume CF-3 repeaters at 25 mi intervals. Max ranges without repeaters is about 45 mi.

² CF-1-B differs from CF-1-A in that it includes a built-in telephone set and drops may be either 2-wire or 4-wire.

³ Built-in signal generator supplies test tone which may be impressed on any channel for line-up purposes.

PRINCIPAL COMPONENTS

Component	Quantity
Telephone Terminal CF-1-(*)	1
Power Unit PE-75-(*)	2
Battery BB-55	2
Rectifier RA-83-(*)	1
Test Equipment IE-53-(*)	1
Tool Equipment TE-123-(*)	1
Telephone EE-8-(*) (CF-1-A only)	1
Running spares: Tubes, protectors, fuses, and vibrator.	

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	1,390	1,664
Total volume (cu ft)	31.7	72
Ship tons		1.9

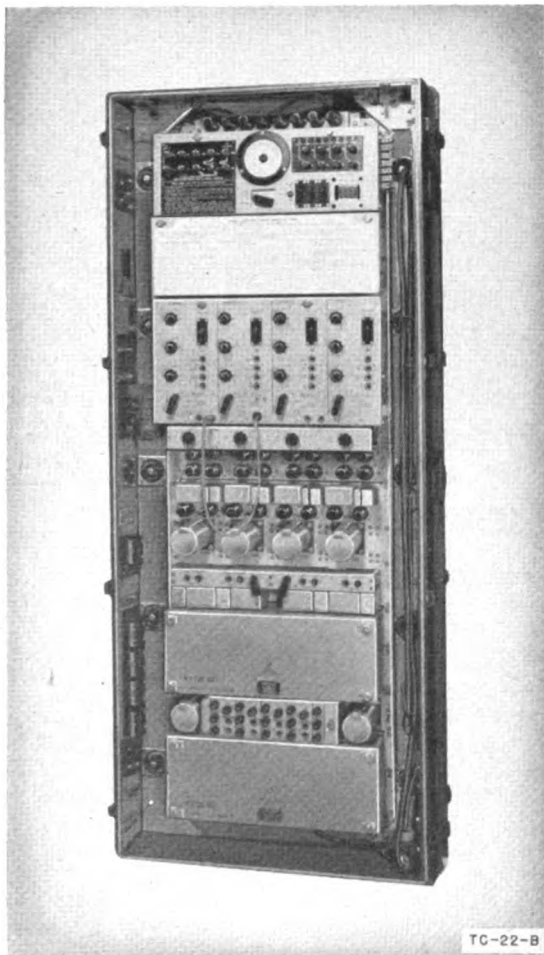


Figure 184. Main Component of Telegraph Terminal Set TC-22-B.

Status: Standard. Stock No.: 4A2822. Reference: TM 11-355B.

Telegraph Terminal Set TC-22-(*) represents TC-22-A and TC-22-B. Telegraph Terminal Set TC-22-(*) is a transportable, telegraph, carrier terminal used in tactical, telegraph (teletypewriter) communication systems. The TC-22-(*) is used in a 4-channel, v-f, carrier telegraph system; it uses eight frequencies in the range from 500 to 2050 cycles. The system provides for two-way transmission, each telegraph channel using two different carrier frequencies for the two directions of transmission. The system is designed for operation over one channel of a 4-channel carrier telephone system, using Telephone Terminal CF-1-(*) (carrier). It may be used over any normal telephone channel which is terminated at the distant end in another Telegraph Terminal Set TC-22-(*).

The major component of Telegraph Terminal Set TC-22-(*) is the Telegraph Terminal CF-2-A or CF-2-B. The Telegraph Terminal CF-2-A is made up of two bays of equipment of two channels each. Telegraph Terminal CF-2-B provides the equipment for all four channels in a single bay. The general design of the circuits of the two types of terminals is the same and a 2-wire, 4-channel system with Telegraph Terminal CF-2-B at one end and Telegraph Terminal CF-2-A at the other end may be operated; however, a single CF-2-A can be operated only on a 2-wire basis. Telegraph Terminal CF-2-B, however, is arranged for 4-wire as well as 2-wire operation. The TC-22-(*) is part of Carrier System AN/TCC-2.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normally -10 dbm per channel, may be raised to 0 dbm for special cases.

LOCATION IN SYSTEM: At the termination of the telephone channel.

RANGE (MAX): Depends on telephone facility, is operative over 25-dbm net loss facility.

POWER REQUIRED: 115 or 230 v, 50 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 425 w max CF-2-A; 276 w max CF-2-B.

TUBE COMPLEMENT: 12 ea 6SJ7, 4 ea 6V6, and 8 ea 394A for the CF-2-A; 20 ea 6SJ7 and 4 ea 394A for the CF-2-B.

LIGHTNING PROTECTION: Carbon blocks at all line and loop binding posts.

MONITORING: Monitoring printer jacks on all channels.

LEVEL INDICATION: All measurements covered.¹

Housing: Racks and panels mounted in wooden case.

Carrier frequencies: 8 tones (595 to 1.955 cps); spaced 170 cyc.

Line terminations: 2-wire or 4-wire telephone line.

Drop and loop terminations: 2-wire or ground return.

¹ Send and receive loop current, send bias, received current, relay test, power supply voltages, and audio-output level. The following loops circuits may be accommodated:

- Full- and half-duplex to either positive or negative battery.
- Half-duplex polarisential.
- Full-duplex two-path polar.

PRINCIPAL COMPONENTS

Component	Quantity	
	Unpacked	Export pack
Telegraph Terminal CF-2-A (2 bays) or Telegraph Terminal CF-2-B (1 bay)	1	1
Maintenance Equipment ME-75	1	1
Chest BC-5	1	1
Clamp TM-106	2	2
Ground Rod MX-148/G	2	2
Running spares: tubes, protectors, fuses, vibrator, and relays.		

WEIGHT AND VOLUME

	Unpacked		Export pack	
	CF-2-A	CF-2-B	CF-2-A	CF-2-B
Total weight (lb)	1,060	621	1,540	840
Total volume (cu ft)	44	24	85	43
Ship tons			2.2	1.1



Figure 185. Repeater Set TC-23 (carrier).

Status: Standard. *Stock No.:* 4B3223. *Reference:* TM 11-341.

Repeater Set TC-23 is a complete, transportable, 4-wire, carrier repeater designed for use at intermediate points in a spiral-four cable system, terminated in Telephone Terminal CF-1-(*). The repeater is composed of two independent amplifying circuits, one of which is associated with the A to B direction of transmission and the other with the B to A direction. It amplifies simultaneously all transmission present on the physical pairs of a spiral-four cable system.

The TC-23 is arranged for d-c signaling and d-c telegraph operation over the two simplex circuits of the spiral-four cable. It has built-in transmission testing equipment, talking and monitoring arrangement for the v-f channel, and automatic transfer from the a-c power supply to the storage battery in case of a power failure. The TC-23 is part of Carrier System AN/TCC-2.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normal output is 0 dbm, may be raised to +5 or +10 dbm.

LOCATION IN SYSTEM: At intermediate points in spiral-four cable system.

RANGE: Repeaters nominally spaced at 25 mi intervals.

POWER REQUIREMENTS: 115 or 230 v, 50 to 60 cyc ac or 12-v storage battery.

NORMAL A-C POWER CONSUMPTION: 31 w.

STAND-BY POWER, CONSUMPTION-CAPACITY:

2 Battery BB-55, 3.75 amp, 40 hr.

TUBE COMPLEMENT: 2 ea 6SJ7, 2 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at cable binding post.

MONITORING: Built-in handset (channel 1 only).

SIGNAL LEVEL INDICATION: Dbm meter.¹

HOUSING: Rack and panels mounted in wooden case.

CARRIER FREQUENCIES: Not applicable² (side bands only).

LINE TERMINATIONS: 4-wire only (600-ohm impedance).

SIGNAL AND ALARM CIRCUIT: Uses one of simplex circuits.

¹ Test tone is applied at either end of the system of CF-1-(*). The dbm meter in the repeater measures the level at the output of each amplifier.

² Each carrier frequency and its upper side band are suppressed by CF-1-(*); only the lower side bands are transmitted over the cable.

PRINCIPAL COMPONENTS

Component	Quantity
Repeater CF-3-(*)(carrier).....	1
Power Unit PE-214-(*).	1
Battery BB-55.....	2
Rectifier RA-83-(*).	1
Test Equipment IE-53.....	1
Tool Equipment TE-123.....	1
Running spares: tubes, protectors, fuses, and vibrator.	

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	460	1, 150
Total volume (cu ft).....	15	42
Ship tons.....		1. 1

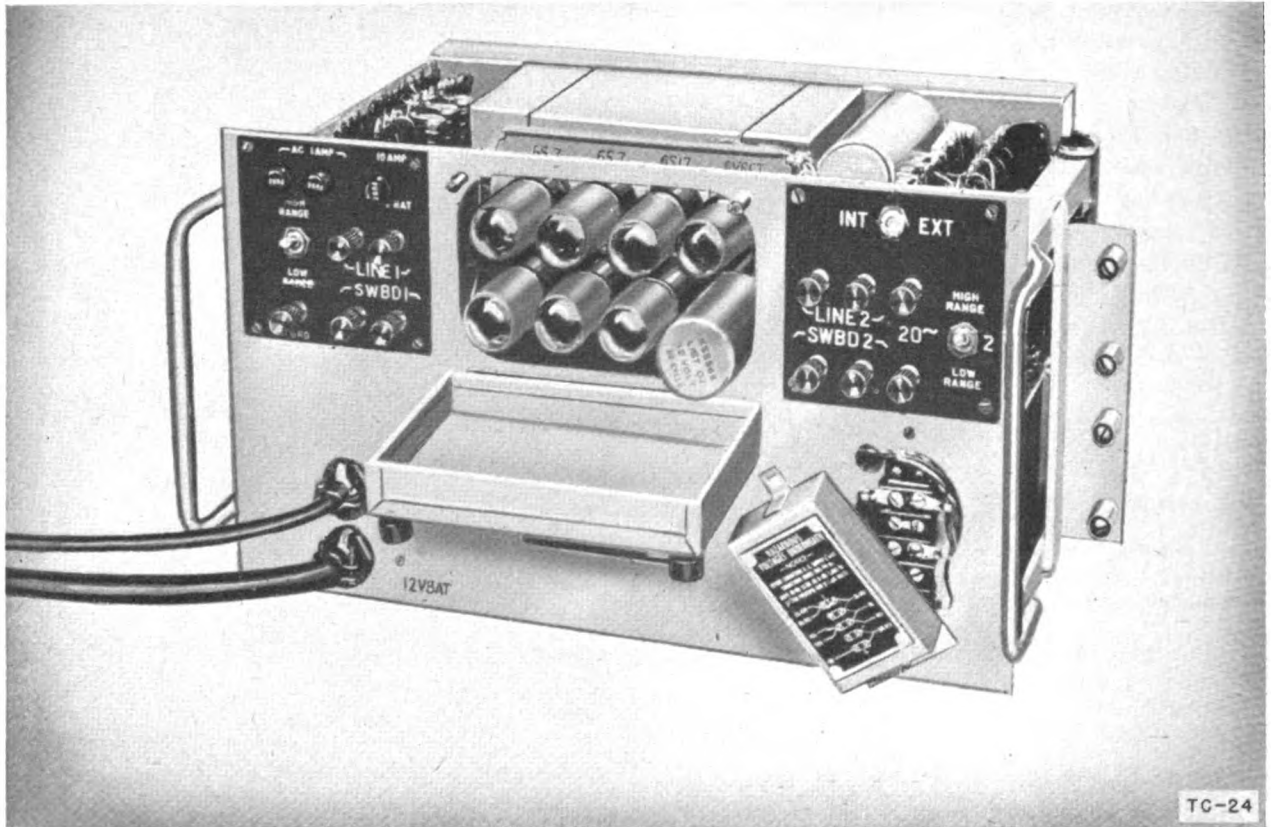


Figure 186. Main Component of Ringer Set TC-24.

Status: Standard. Stock No.: 4F2124. Reference: TM 11-342.

Ringer Set TC-24 is a v-f ringer set designed for tactical use to provide signaling over voice channels and telephone lines which will not transmit l-f ringing current. This set provides ringing facilities for two circuits derived from a carrier system or from telephone lines equipped with telephone repeaters. One Ringer Set TC-24 is required at each end of the telephone circuit.

l-f ringing current sent from the switchboard or magneto telephone causes the ringing equipment to send out a 1,000-cycle current interrupted about 20 times per second on the line. The ringing equipment at the distant terminal responds to the impulses of 1,000-cycle current causing a new supply of l-f ringing current to be sent toward the distant terminal switchboard or magneto telephone set. The TC-24 was designed primarily for a-c operation, but in an emergency, such as a power failure, it is automatically thrown over to a storage battery. The TC-24 is part of carrier System AN/TCC-2.

TECHNICAL CHARACTERISTICS

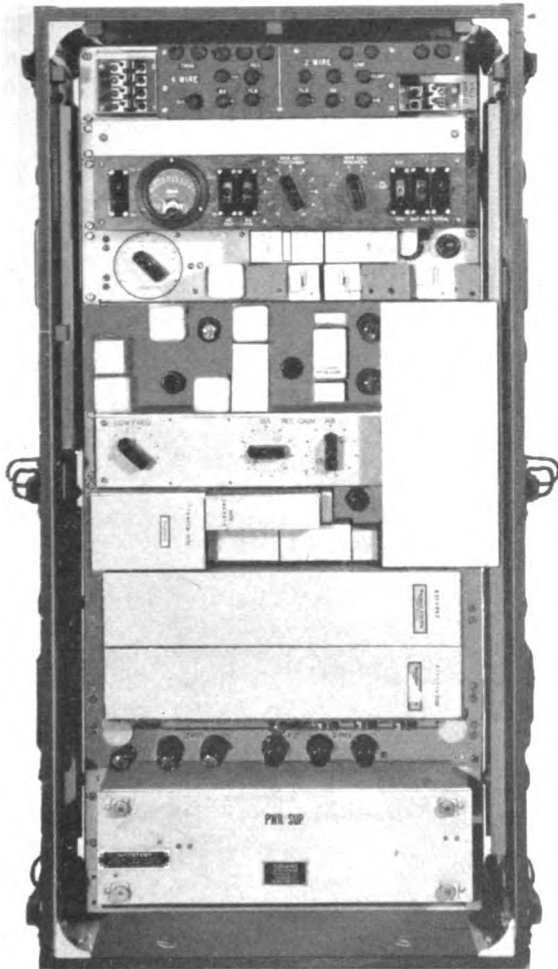
- OPERATING LEVELS:** For less than a 20-lb line, sensitivity can be reduced 10 db.
- LOCATION IN SYSTEM:** Adjacent to CF-1-(*) in drop circuit.
- RANGE:** 1,000 eye receiving branch will operate from 30-db net loss line.
- POWER REQUIREMENTS:** 115 or 230 v, 50 to 60 eye ac or 12-v storage battery.
- NORMAL A-C POWER CONSUMPTION:** 31 w.
- STAND-BY POWER, CONSUMPTION-CAPACITY:** 2 Battery BB-55, 3.2 amp, 45 hr.
- TUBE COMPLEMENT:** 6 ea 6SJ7, 1 ea 6V6.
- HOUSING:** Rack and panel mounted in wooden case.
- FREQUENCY:** 1,000 cps, interrupted 19% times per second.
- LINE TERMINATIONS:** Inserted in 2-wire drop.

PRINCIPAL COMPONENTS

Component	Quantity
Ringing Equipment EE-101-A.....	1
Battery BB-55.....	2
Case CS-111.....	1
Chest BC-5.....	1
Running spares: tubes, fuses, and vibrator	

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	284	448
Total volume (cu ft).....	10	17
Ship tons.....		.4



TC-33

Figure 187. Main Component of Converter Set TC-33.

Status: Standard. Stock No.: 4B449-33. Reference: TM 11-2008.

Converter Set TC-33 is a complete, transportable, group modulator designed for adapting the 4-wire transmission of CF-1-(*) to a 2-wire, open wire, line. It provides equivalent 4-wire operation over one open wire pair. The B to A direction of transmission remains in the .2- to 11.6-kc frequency band; the transmission in the A to B

direction is raised to the 20.8- to 32.2-kc band. The use of Converter Set TC-33 results in economy of outside plant equipment for a given number of communication channels.

The TC-33 contains amplifiers, equalizers, oscillator, modulator, demodulator, directional filters, composite set, built-in testing equipment, and automatic transfer from a-c power supply to storage batteries in case of a-c power supply failure.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: A to B output +18 to -17 dbm (+13 dbm normal); B to A output +15 to -20 dbm (+10 dbm normal).

LOCATION IN SYSTEM: At junction of 4-wire and 2-wire open wire facilities.¹

RANGE: Dependent on the characteristics of open wire facility used.

POWER REQUIREMENTS: 115 or 230 v, 50 to 60 cyc ac or 12-v storage battery.

NORMAL A-C POWER CONSUMPTION: 31 w.

STAND-BY POWER, CONSUMPTION-CAPACITY: 2 Battery BB-55, 4.5 amp, 33 hr.

TUBE COMPLEMENT: 3 ea 6SJ7, 3 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at line and cable binding post.

MONITORING: Monitor at adjacent CF-1-(*) or CF-3-(*).

SIGNAL LEVEL INDICATION: Dbm meter.

HOUSING: Rack and panels mounted in wooden case.

CARRIER FREQUENCIES: 20,650 cps (upper side band transmitted).

LINE TERMINATIONS: 4-wire on one side, 2-wire open wire on other side.

SIGNAL AND ALARM CIRCUIT: Uses one of the composite circuits.

¹ Will normally be operated adjacent to Telephone Terminal CF-1-(*) or Repeater CF-3-(*), but can be separated from them by as much as 1 mi of spiral-four cable.

PRINCIPAL COMPONENTS

Component	Quantity
Converter CF-4-(*)	1
Battery BB-55	2
Case CS-111	1
Chest BC-5	1
Clamp TM-106	2
Ground Rod MX-148/G	2
Running spares: tubes, protectors, fuses, and vibrator.	

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	570	830
Total volume (cu ft)	22	44
Ship tons		1.1

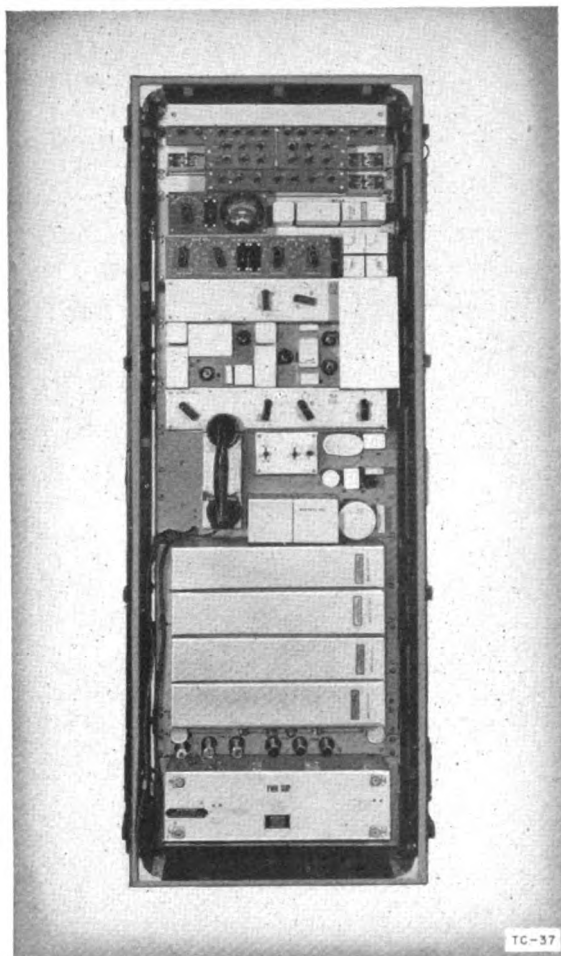


Figure 188. Main component of Repeater Set TC-37.

Status: Standard. Stock No.: 4B3237. Reference: TM 11-2008.

Repeater Set TC-37 is a complete, transportable, open wire, carrier repeater set designed for use at intermediate points on a 2-wire, open wire line which uses Converters CF-4 at the terminals. The TC-37 extends the range of the wire facility used by amplifying simultaneously all transmission present on the physical pair of an open wire circuit.

Repeater Set TC-37 contains amplifiers, equalizers, directional filters, composite equipment, built-in transmission testing equipment, talking and monitoring arrangement on channel 1, and automatic transfer from the a-c power to the storage batteries in case of a-c power supply failure.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: A to B output normally +13 dbm; B to A output normally +10 dbm.

LOCATION IN SYSTEM: At intermediate points (CF-4 system).

RANGE: Dependent on characteristics of open wire facility used.

POWER REQUIREMENTS: 115 or 230 v, 50 to 60 cyc ac or 12-v storage battery.

NORMAL A-C POWER CONSUMPTION: 46 w.

STAND-BY POWER, CONSUMPTION CAPACITY: 2 Battery BB-55, 4.5 amp, 33 hr.

TUBE COMPLEMENT: 3 ea 6SJ7, 3 ea 6V6.

LIGHTNING PROTECTION: Carbon blocks and drainage coils at line binding posts.

MONITORING: Built-in handset (channel 1 only).

SIGNAL LEVEL INDICATION: Dbm meter.¹

HOUSING: Rack and panels mounted in wooden case.

LINE TERMINATIONS: 2-wire only (600-ohm impedance).

SIGNAL AND ALARM CIRCUIT: Uses one of the composite circuits.

¹ Test tone is applied at either end of the system by CF-1-(*). The dbm meter in the repeater measures the level at the output of each amplifier.

PRINCIPAL COMPONENTS

Component	Quantity
Repeater CF-5-(*)	1
Battery BB-55	2
Power Unit PE-214	1
Rectifier RA-83	1
Total Equipment TE-123	1
Chest BC-5	1
Test Equipment IE-53	1
Telephone EE-8-(*)	1
Case CS-111	1
Clamp TM-106	2
Ground Rod MX-148/G	2
Running spares: tubes, protectors, fuses, and vibrator.	

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	860	1,180
Total volume (cu ft)	34	53
Ship tons		1.3

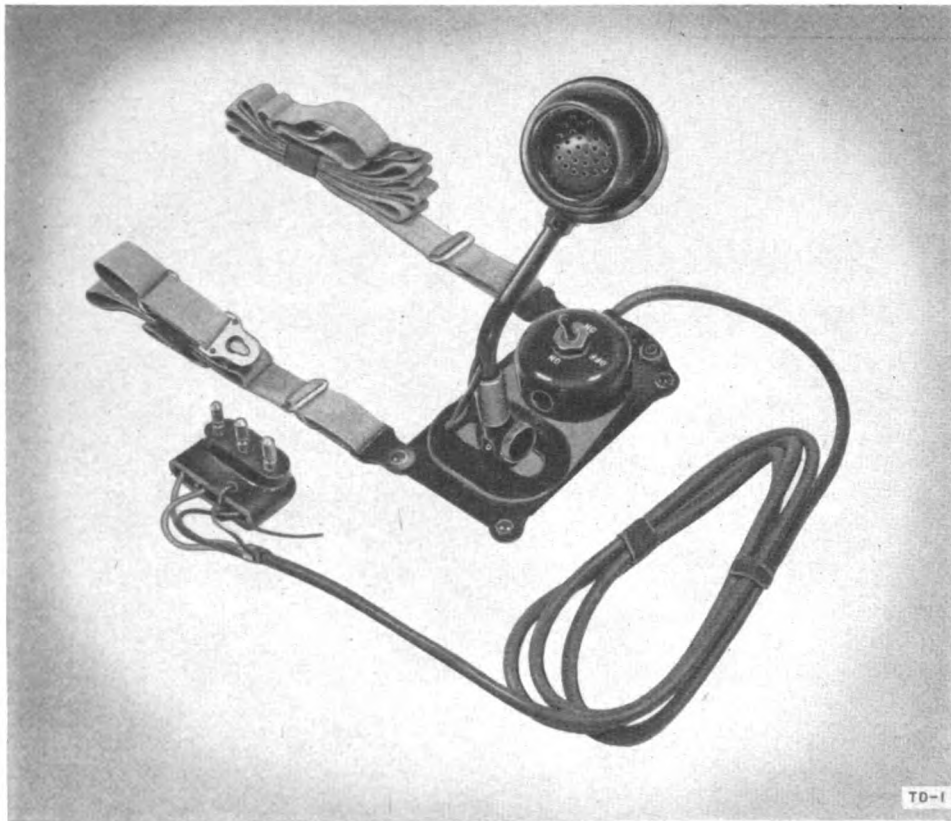


Figure 189. Chest Set TD-1.

Status: Limited/Std. *Stock No.:* 4B417. *Reference:* TB SIG 129.

Chest Set TD-1 consists of Chest Unit T-26, a transmitter arm, Switch SW-118, Straps ST-24 and ST-25, Cord CC-333, and Plug PL-58. The TD-1-A differs from the TD-1 in that the microphone is connected to the switch block by both a cord and plug to permit the substitution of microphones.

Chest Set TD-1 is used with its regular microphone or with Microphone T-45 to make up a telephone switchboard operator's headset. It is part of the following equipments:

Telephone Central Office Set TC-4.

Telephone Central Office Set TC-12.

Sound Ranging Set GR-3-C.

Flash Ranging Set GR-4-A.

Chest Set TD-1 is to be replaced by Chest Set H-18/GT.

TECHNICAL CHARACTERISTIC

MICROPHONE: Nonpositional, carbon microphone, 75-ohm impedance. Efficiency in db versus arbitrary reference condition (Handset TS-9): from -5 to 300 cps to +8 at 2,000 cps.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	.8	3.9
Total volume (cu ft).....	.16	.25

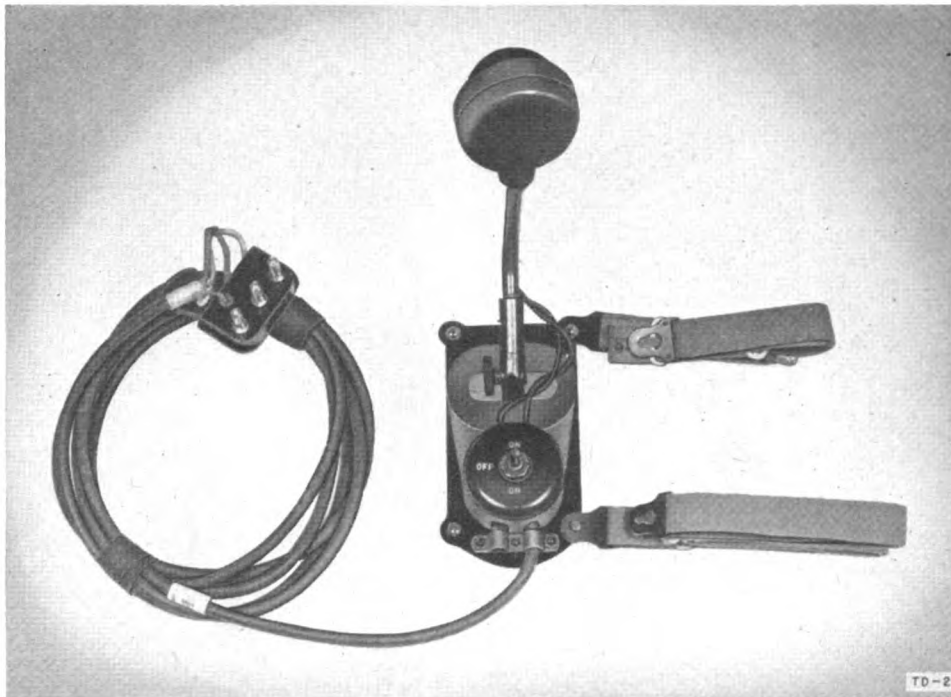


Figure 190. Chest Set TD-2.

Status: Limited/Std. Stock No.: 4B417-2 (TD-2) and 4B417-2A (TD-2-A). Reference: TB SIG 129.

Chest Set TD-2-(*) represents TD-2 and TD-2-A. Chest Set TD-2-(*) consists of Chest Unit T-26-A, Straps ST-24 and ST-25, Cord CC-343, and Plug PL-58. The TD-2-A differs from the TD-2 in that the TD-2 uses Chest Unit T-26 and does not include Cord CC-343 and Plug PL-58.

Chest Set TD-2-(*) is used with Microphone T-30 or T-45 to make up a telephone switchboard

operator's headset and chest set. Chest Set TD-2-(*) is to be replaced by Chest Set H-19/GT.

TECHNICAL CHARACTERISTIC

MICROPHONE: Nonpositional, carbon microphone, 50-ohm impedance. Efficiency in db versus arbitrary reference condition (Handset TS-9): from -5 at 300 cps to +8 at 2,000 cps.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	.8	4.3
Total volume (cu ft).....	.16	.203

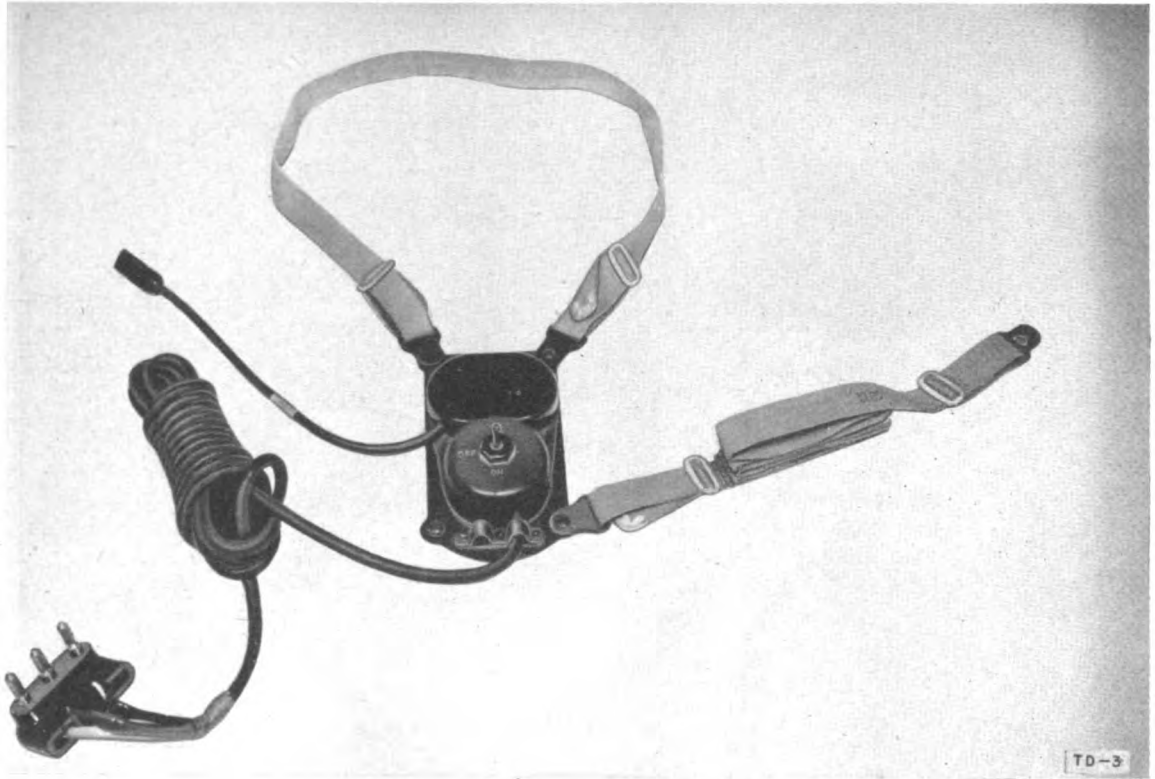


Figure 191. Chest Set TD-3.

Status: Limited/Std. Stock No.: 4B417-3. Reference: TB SIG 129.

Chest Set TD-3 consists of Chest Unit T-46, Straps ST-24 and ST-25, Cord CC-346, Cord CC-343, and Plug PL-58.

Chest Set TD-3 is designed to be worn on the chest and provides a means of interconnecting Microphone T-30 or T-45 to Telephone EE-8- (*) or various types of switchboards for operation

when wearing a gas mask. The TD-3 can be used with Headset HS-30- (*) to replace Head and Chest Set HS-27- (*).

TECHNICAL CHARACTERISTIC

Dependent on microphone and headset used.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb) .....	. 6	5. 3
Total volume (cu ft) .....	. 14	. 76



Figure 192. Chest Set TD-4.

Status: Standard. *Stock No.:* 4B417-4. *Reference:* TM 11-2564.

Chest Set TD-4 includes a carrying strap, Chest Unit T-51, and Cord CD-802. The chest unit has a two-position LOCK ON and HOLD ON switch and jacks for the plugs at the ends of a microphone and headset. Cord CD-802 terminates at one end in Plugs PL-55-A and PL-68-A for connection to the chest set jacks on a control-amplifier unit and at the other end in Jack JK-53 for connection to Chest Unit T-51.

Chest Set TD-4 is a component of Intercom-

munication Set PA-8. It is used with Headset H-16/U, Microphone T-45, and Cord CX-165/TIQ-3 to form an operator's head and chest set at the control station of an Intercommunication Set PA-8. Headset and microphone are ordered separately.

TECHNICAL CHARACTERISTIC

Dependent on microphone and headset used.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	1.3	5.9
Total volume (cu ft).....	.02	.64

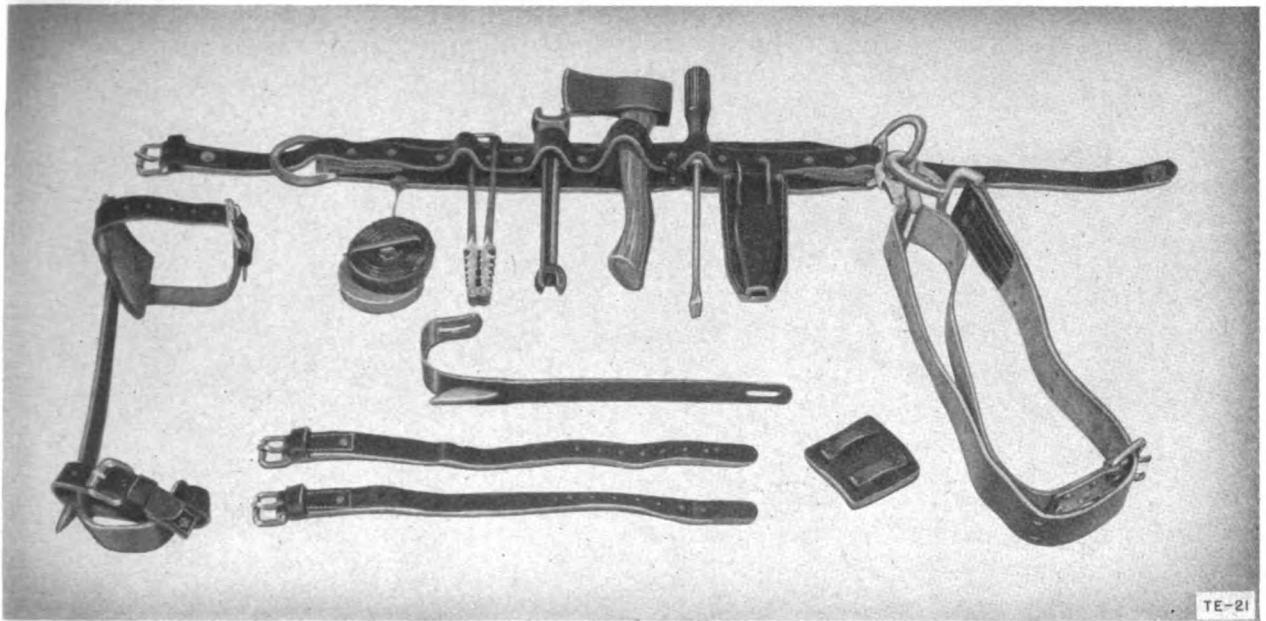


Figure 193. Lineman's Equipment TE-21.

Status: Standard. *Stock No.:* 6Q3521. *Reference:* TM 11-2262.

Lineman's Equipment TE-21 is an assembly of equipment consisting of climbers, belt, and tools. It is used by telephone linemen in the construction and repair of open wire telephone lines. The TE-21 is not stocked as a unit but is made up on requisition.

PRINCIPAL COMPONENTS

Bag BG-44: tool, canvas.
 Belt LC-23: available in 8 sizes with 70-in. safety strap, tool holder and tape holder.

Clamp LC-24: splicing, combination; 11¼ in.
 Screw driver TL-106; 10-in. blade, ¾-in. tip, insulated wooden handle, 17 in. overall.
 Climbers IL-5: lineman's, 15-in. complete with straps and pads.
 Hammer HM-1: 2-face, 2-lb.; 16-in. handle.
 Pliers TL-107: side-cutting, 8-in.
 Wrench LC-25: combination, lag screw, 13½ in. long.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	16	22
Total volume (cu ft).....	.6	.75

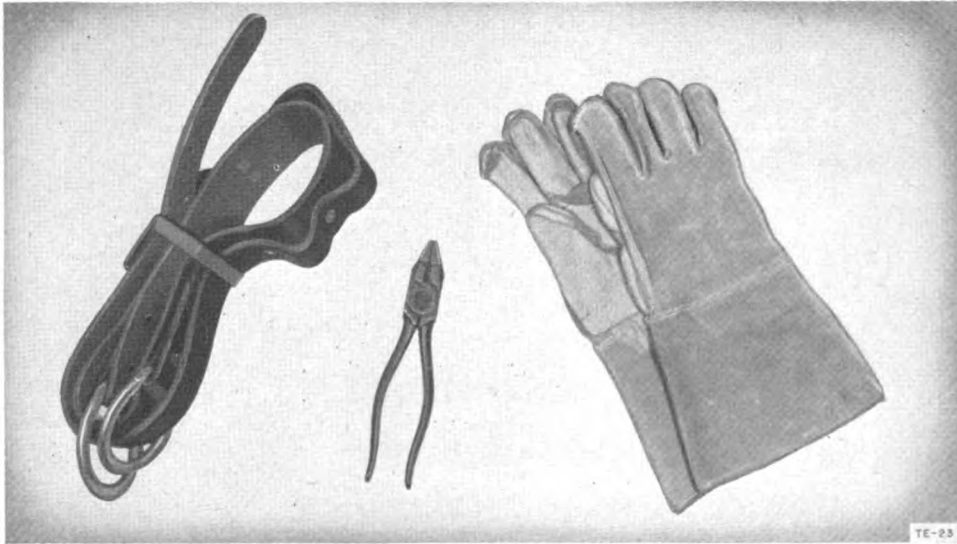


Figure 194. Groundman's Equipment TE-23.

Status: Standard. Stock No.: 6Q48523. Reference: TM 11-2262.

Groundman's Equipment TE-23 is an assembly of equipment consisting of belt, gloves, and tools used by groundmen in the construction and repair of open wire telephone lines. The TE-23 is not stocked as a unit but is made up on requisition.

PRINCIPAL COMPONENTS

Belt LC-23: available in 8 sizes, with tool holder and tape holder.

Gloves LC-10: size 9½, heavy leather.

Pliers TL-107: side-cutting, 8 in.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)	6	8.2
Total volume (cu ft) .....	.2	.3

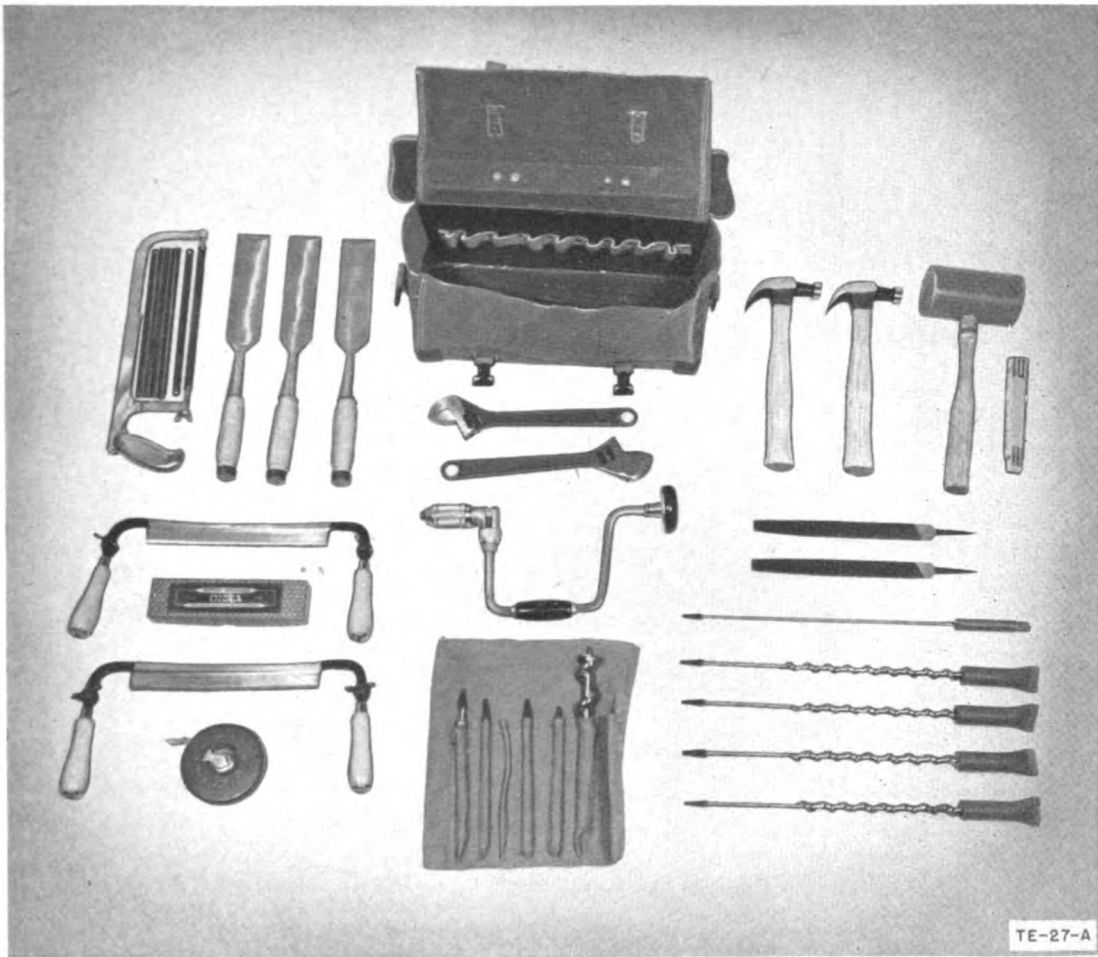


Figure 195. Tool Equipment TE-27-A.

Status: Standard. Stock No.: 6R38027. Reference: TM 11-2262.

Tool Equipment TE-27-A is an assembly of tools used in the construction of open wire telephone lines. The TE-27-A consists essentially of tools required for gaining and facing poles and for the setting of pins in the cross arms.

PRINCIPAL COMPONENTS

Component	Quantity
Bag BG-44	1
Bit, auger: $\frac{3}{8}$ in.	2
Bit, auger: $\frac{1}{2}$ in.	2
Bit, auger: $1\frac{1}{4}$ in.	2
Bit, car: $\frac{1}{16}$ by 18 in. long	4
Bit, bell hanger: $\frac{3}{8}$ by 18 in. long	1
Brace, ratchet: 12 in.	1
Chisel, wood: 2 in.	3

Component	Quantity
File, bastard: 10 in.	2
Frame, hack-saw	1
Hammer TL-39	2
Knife, draw, 10 in.	2
Mallet: round $3\frac{1}{2}$ by $5\frac{1}{2}$ in.	1
Oilstone, combination	1
Rule: 6 ft, Stanley #806	1
Scabbard, bit	4
Scabbard, bit	1
Tape, measuring: 50 ft.	1
Tool Roll BG-47	1
Wrench, pipe: 14 in.	2

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	33	57
Total volume (cu ft)	1.5	2
Ship tons		.05



Figure 196. Tool Equipment TE-44.

Status: Standard. *Stock No.:* 6R38044. *Reference:* TM 11-340.

Tool Equipment TE-44 is an assembly of tools and equipment contained in Chest CH-58. The chest forms a workbench when the top is removed. Some tools and equipment are permanently mounted on the chest and are considered a part of Chest CH-58.

Tool Equipment TE-44 is used in the installation and maintenance of tactical telephone central office sets and is part of Telephone Central Office Sets TC-1, TC-2, TC-5, and TC-10.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Bit Equipment TE-25	1
Chest CH-58	1
Frame, hack-saw	1
Hammer, riveting: 4 oz	1
Hydrometer	1
Pliers TL-107	1
Pliers TL-126	1
Pliers: heat coil extractor	1
Screw driver, ratchet: 3-in. blade	1
Screw driver, automatic: No. 30A	1
Screw driver: all steel, 5-in. blade	2
Soldering Iron TL-117	1
Soldering iron: 1½ in.	1

<i>Component</i>	<i>Quantity</i>
Brace, ratchet: 10 in.	1
Cutnippers: 7 in.	1
Hammer, ball pein: 1 lb.	1
Hammer TL-39	1
Pliers TL-13	1
Pliers TL-103	2
Pliers, flat-nosed	1
Screw driver Set TL-128	1
File set	1
Screw driver, ratchet: 6-in. blade	1
Screw driver, Phillips: 4-in. blade	1
Snips, tinnern	1
Solder Iron TL-120	1
Soldering iron: 3 in.	1
Torch TL-130	1
Wrench set, crescent	1
Wrench set, socket	1
Wrench, 10 in.	1
Wrench TL-112	1
Voltmeter: 300 v, ac	1
Wrench set, open-end	1
Wrench, 7 in.	1
Wrench TL-111	1
Wrench TL-204	1

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)	250	300
Total volume (cu ft)	8	9.5
Ship tons		.23

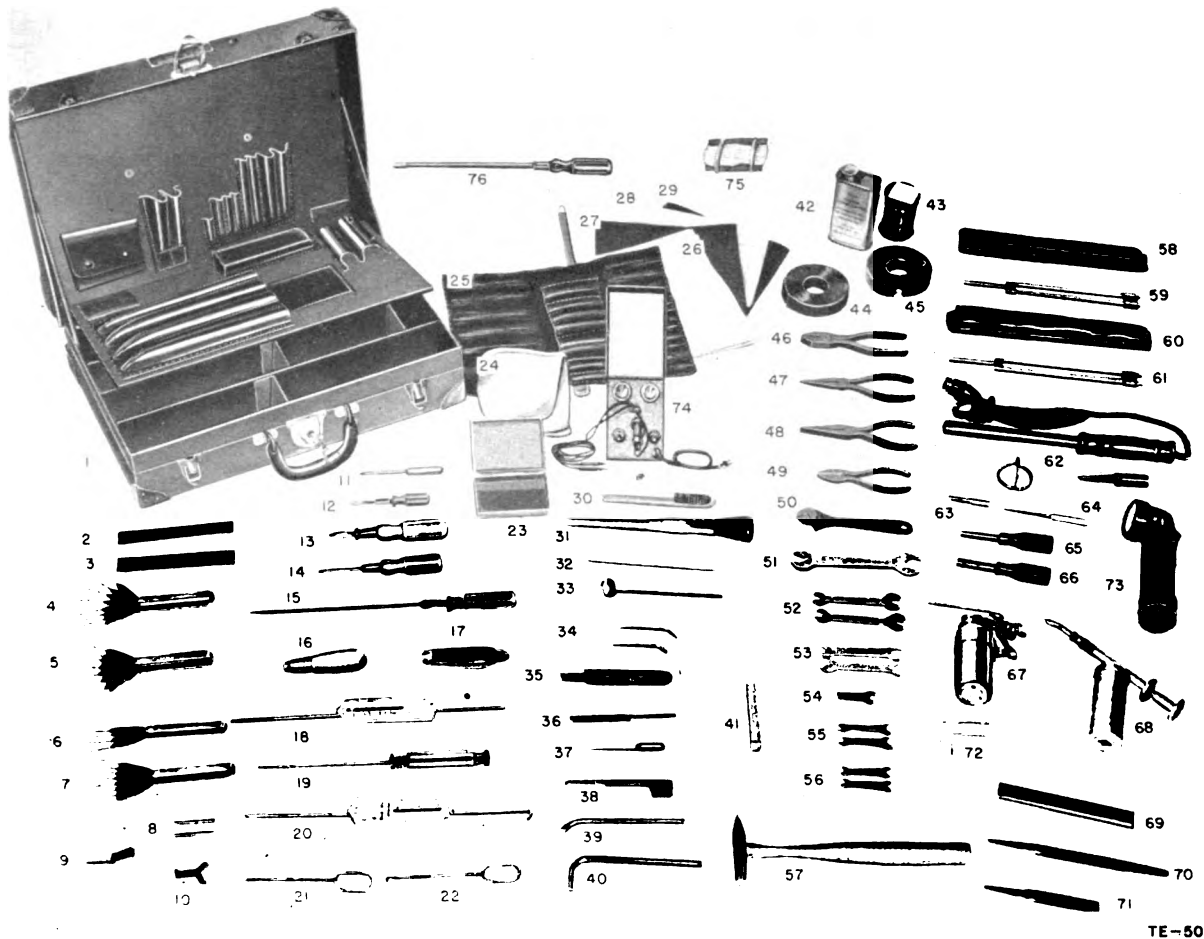


Figure 197. Tool Equipment TE-50.

Status: Standard. Stock No.: 6R38050. Reference: TM 11-352.

Tool Equipment TE-50 is an assembly of tools and expendable supplies used by teletypewriter repairmen for the repair and field maintenance of teletypewriter equipment. The TE-50 consists essentially of special and general tools and test equipment.

PRINCIPAL COMPONENTS

Component	Quantity
Case CS-78.....	1
File, flat: 6 in.....	1
File, half-round: 6 in.....	1
Flashlight TL-122.....	1
Gun, grease.....	1
Hammer, riveting: 4 oz.....	1
Knife TL-29.....	1
Magnet M-129.....	1
Mirror, dental.....	1
Oiler, 6 oz.....	1

Component	Quantity
Pliers TL-13.....	1
Pliers TL-103.....	1
Pliers TL-126.....	1
Pliers, duck-billed: 6-in.....	1
Rule: steel, 6 in.....	1
Screw driver: 1½ in. blade.....	1
Screw driver: 20-in. blade.....	1
Screw driver: Upson Bros TR-10.....	1
Screw driver TL-21.....	1
Screw driver TL-44.....	1
Soldering Iron TL-117.....	1
Test Unit I-236.....	1
Tool set: Teletype type 81124.....	1
Tuning fork: 96.19 vps.....	1
Tuning fork: 87.6 vps.....	1
Wrench TL-111.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....		44
Total volume (cu ft).....		.2
Ship tons.....		.05

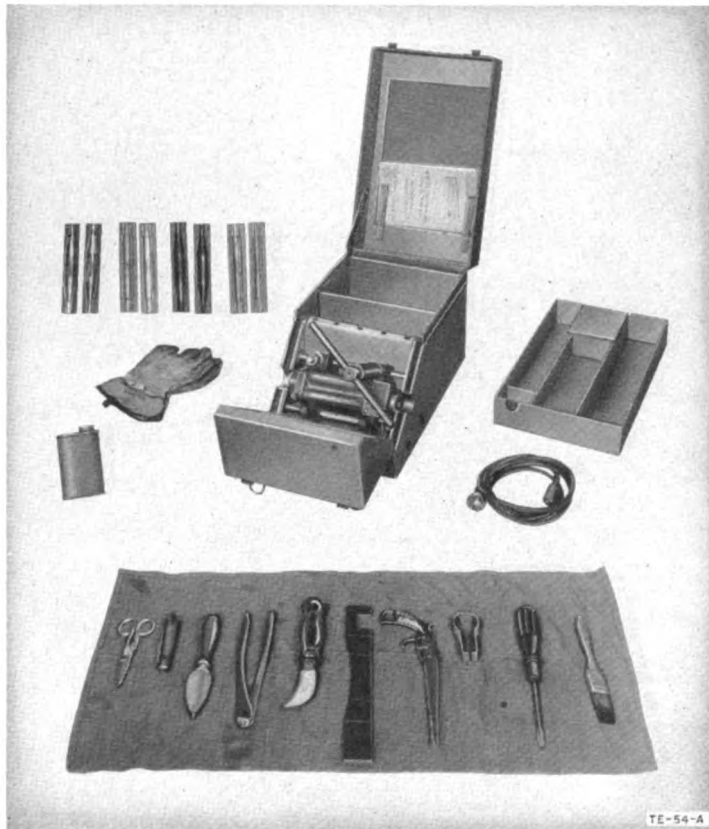


Figure 198. Vulcanizing Equipment TE-54-A.

Status: Limited/Std. Stock No.: 6R47254.
Reference: TM 11-367.

Vulcanizing Equipment TE-54-(*) represents TE-54-A and TE-54-B. Vulcanizing Equipment TE-54-(*) is an assembly of equipment which consists of a chest, molds, tools, vulcanizer, and expendable materials. The TE-54-(*) is used for splicing and patching Cables WC-534, WC-535, and WC-548. It is also used for splicing two Cables WC-534 to one Cable WC-535. This latter operation is referred to as potheading.

The purpose of Vulcanizing Equipment TE-54-(*) is to produce a waterproof splice or jacket repair on a rubber-jacketed cable by applying vulcanizing heat to a raw-rubber wrapping at the splice of area to be repaired. The TE-54-(*) produces sufficient heat for proper curing of the rubber, provided the curing times specified are followed. Vulcanizing Equipment TE-54-(*) differs from Vulcanizing Equipment TE-55-(*) only in the amount of expendable material furnished and in the size of the chest.

TECHNICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 115 v, 50 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: TE-54-A,
500 w; TE-54-B, 700 w.
OPERATING TEMPERATURE: 305° F.
CURING TIME: 35 min total.

PRINCIPAL COMPONENTS

Component	Quantity
Vulcanizer kit ¹	1
Molds, patching.....	3
Molds, splicing.....	3
Chest CH-94-B.....	1
Cable clamps.....	2
Power supply cord.....	1
Bushing, pothead.....	1 pr
Blocks, pothead.....	1 pr
Soldering Iron TL-120.....	1
Tool roll, with tools.....	1

¹ The TE-54-A has a vulcanizing kit equipped with a bolt and nut type clamp. The TE-54-B has a vulcanizing kit equipped with a vise-type clamp.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	262	315
Total volume (cu ft).....	7.5	14
Ship tons.....		.35



Figure 199. Vulcanizing Equipment TE-55-A.

Status: Limited/Std. Stock No.: 6R47255.
Reference: TM 11-367.

Vulcanizing Equipment TE-55-(*) represents TE-55-A and TE-55-B. Vulcanizing Equipment TE-55-(*) is an assembly of equipment which consists of a chest, molds, tools, vulcanizer, and expendable materials. The TE-55-(*) is used for splicing and patching Cables WC-534, WC-535, and WC-548. It is also used for splicing two Cables WC-534 to one Cable WC-535. This latter operation is referred to as potheading.

The purpose of Vulcanizing Equipment TE-55-(*) is to produce a waterproof splice or jacket repair on rubber-jacketed cable by applying vulcanizing heat to a raw-rubber wrapping at the splice or area to be repaired. The TE-55-(*) produces sufficient heat for proper curing of the rubber, provided the curing times specified are followed. Vulcanizing Equipment TE-55-(*) differs from Vulcanizing Equipment TE-54-(*) only in having more expendable material and being furnished with a larger chest.

TECHNICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 115 v, 50 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: TE-55-A,
500 w; TE-55-B, 700 w.
OPERATING TEMPERATURE: 305° F.
CURING TIME: 35 min total.

PRINCIPAL COMPONENTS

Component	Quantity
Vulcanizer kit ¹	1
Molds, patching.....	3
Chest CH-75-C.....	1
Cable clamps.....	2
Power supply cord.....	1
Bushing, pothead.....	1 pr
Soldering Iron TL-120.....	1
Tool roll, with tools.....	1

¹ The TE-55-A has a vulcanizing kit equipped with a bolt and nut type clamp. The TE-55-B has a vulcanizing kit equipped with a vise-type clamp.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	380	415
Total volume (cu ft).....	9	12.1
Ship tons.....		.3

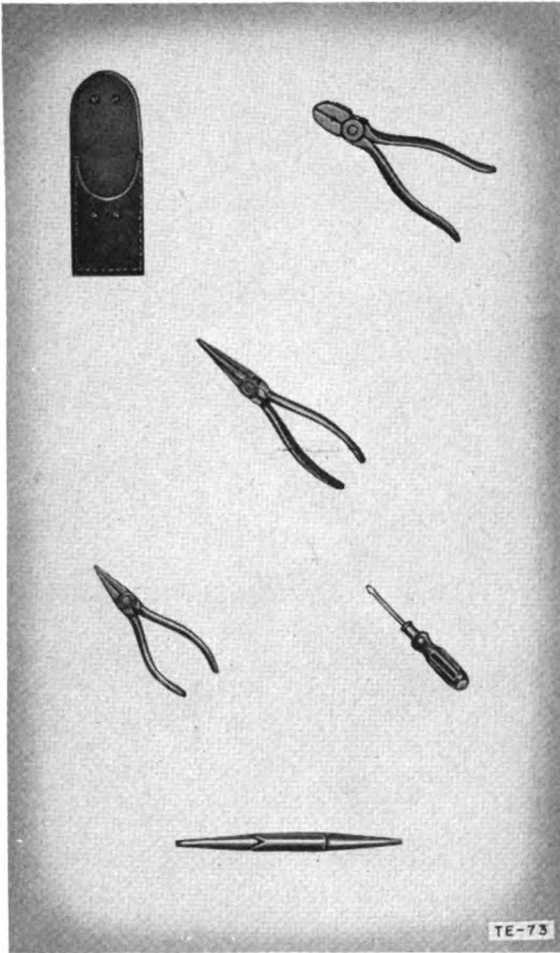


Figure 200. Tool Equipment TE-73.

Status: Standard. Stock No.: 6R38073.

Tool Equipment TE-73 is an assembly of small tools contained in a leather case and used by central office maintenance men for general maintenance work.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Case, tool, leather, WECO R-2468.....	1
Cutter, wire, diagonal: 5 in.....	1
Pliers, long-nosed: 6½ in.....	1
Pliers, short-nosed: 6-in.....	1
Screw driver: 3-in. blade, 7½ in. long.....	1
Spudger, fiber: 5½ in. long.....	1

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	3.4	5
Total volume (cu ft).....		.2

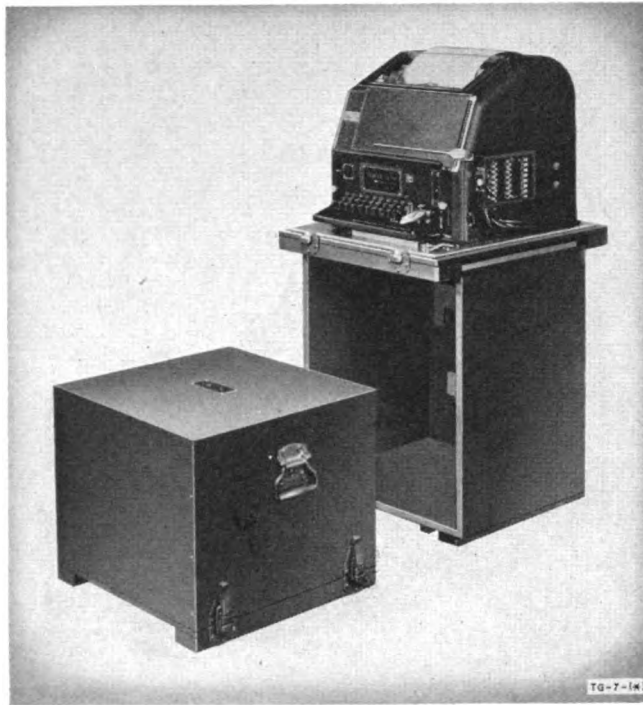


Figure 201. Teletypewriter TG-7-A.

Status: Standard. Stock No.: 4T2.28. Reference: TM 11-352.

Teletypewriter TG-7-(*) represents TG-7-A and TG-7-B. Teletypewriter TG-7-(*) is a portable field teletypewriter designed to interchange typewritten messages by electrical means between two or more points. The TG-7-(*) is a page-receiving and keyboard-sending teletypewriter, which is equipped with a standard communication keyboard, type-bar arrangement, pulling magnetic selector, and no line relay. It has a series-governed, a-c motor controlled by switch or automatic built-in control. Teletypewriter TG-7-A is the same as the TG-7-B except that certain minor features, not required in tactical service, have been omitted from the later model. Teletypewriter TG-7-(*) is a component part of Teletypewriter Sets EE-97, EE-97-A, EE-98, EE-98-A and Telegraph Central Office Set TC-3.

Teletypewriter TG-7-(*) is used in the tactical teletypewriter communication nets of divisions, corps, army, and other teletypewriter systems that require teletypewriters of the capabilities of the TG-7-(*) .

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, 60-ma; 5-unit start-stop teletypewriter code.

POWER REQUIREMENTS:

TG-7-A: 115 v dc, 110 w; 115 v ac, 50 to 60 cyc; 140 va.

TG-7-B: 115 v dc, 110 w; 115 v ac, 25, 40, 50, and 60 cyc; 140 va.

SPEED OF OPERATION: 60 speed (368 opm).

66 speed (404 opm).

LINE PROTECTION: Fuses in auxiliary equipment.

AUXILIARY EQUIPMENT: Line Unit BE-77-(*) .

PRINCIPAL COMPONENTS

Component	Quantity	
	TG-7-A	TG-7-B
Typing unit	1	1
Teletypewriter base.....	1	1
Keyboard	1	1
Motor unit.....	1	1
Cover (teletypewriter)	1	1
Speed indicator	1	0
Chest CII-50-A.....	1	0
Chest CH-50-B.....	0	1
Chest CH-62-A.....	1	0
Chest CH-62-B.....	0	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	225	400
Total volume (cu ft).....	8.7	27
Ship tons.....		.7

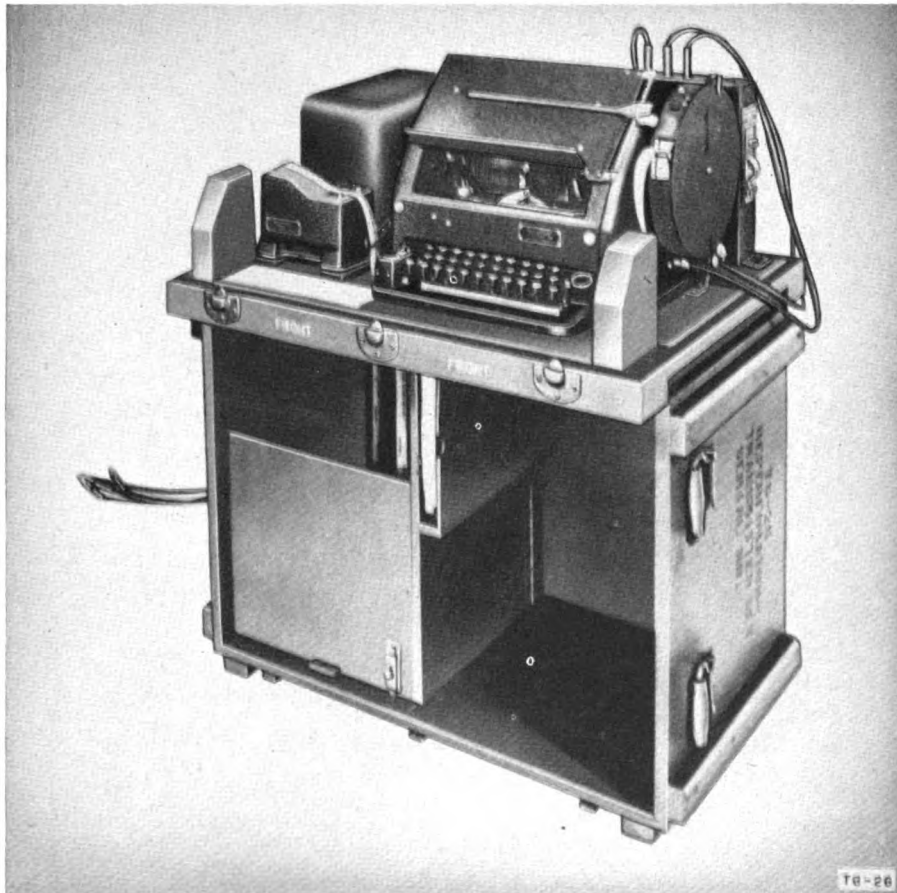


Figure 202. Reperforator-Transmitter TG-26-A.

Status: Standard. *Stock No.:* 4TRTKXDS-GDCSZ. *Reference:* TM 11-2201.

Reperforator-Transmitter TG-26-A is an assembly of equipment which consists of a typing perforator, keyboard, tape container, transmitter, and jack box, all mounted together on a common base and equipped with a wooden case-type cover. The cover serves as a table when the TG-26-A is made ready for operation. The TG-26-A is the main component of Reperforator Teletypewriter Set TC-16.

Reperforator-Transmitter TG-26-A perforates and types messages on tape from the keyboard locally, or from line signals, and sends signals from tape which is run through the transmitter. It is particularly adaptable for use at message distribution centers because the perforated tape may be used to retransmit the message to one or more stations by means of the transmitter. Thus, the necessity for manual transmission by direct keyboard or manual preparation of perforated

tape is eliminated. The typewritten characters on the tape facilitate identification and distribution of the message tape at a message center. The TG-26-A is intended for use in the tactical teletypewriter systems of Corps and Army.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, 60-ma circuit.
POWER SUPPLY REQUIRED: 115 v, 50 to 60 cyc ac and 115 v dc. Both furnished from Rectifier RA-87.
SPEED OF OPERATION: 60 speed (368 opm); 66 speed (404 opm).
KEYBOARD: Standard communication type.
TAPE: Chadless; $1\frac{1}{16}$ in. wd.
LINE TERMINATION PROTECTION: Furnished by Line Unit BE-77-A.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb)-----	225	290
Total volume (cu ft)-----	10	21
Ship tons-----		.6



Figure 203. Telegraph Terminal TH-1/TCC-1.

Status: Standard. *Stock No.:* 4A2895. *Reference:* TM 11-2206.

Telegraph Terminal TH-1/TCC-1 is a single-channel carrier telegraph terminal. It derives one carrier telegraph circuit from a telephone circuit while retaining the voice circuit. Separation of speech and telegraph currents is accomplished by band elimination filters which block out about 1,500 to 2,000 cycles for telegraph use. D-c loops are neutral, half-duplex, full-duplex, polarential, or two-path polar. V-f ringing is required on telephone circuits on which the TH-1/TCC-1 is used. A v-f ringer is part of the TH-1/TCC-1. Filter F-2/GG is used at intermediate points to bypass telephone equipment. The carrier is on for MARK and off for SPACE. Telegraph Terminal TH-1/TCC-1 may be stacked with packaged equipments. Telegraph Terminal Set AN/TCC-1 was formerly assigned to cover TH-1/TCC-1 plus auxiliary apparatus; however, standardization was not based on the set—only TH-1/TCC-1 and Filter F-2/GG. Auxiliary apparatus, if required, should be requisitioned separately.

Telegraph Terminal TH-1/TCC-1 is used in the teletypewriter communication nets of Army, Army groups, and of the communications zone of a theater of operations.

TECHNICAL CHARACTERISTICS

- OPERATING LEVELS:** Normal -3 dbm may be raised to +4 dbm.
- LOCATION IN SYSTEM:** At termination of telegraph circuit.
- RANGE:** Operable over telephone channel having an attenuation of 50 db.
- POWER REQUIRED:** 115 to 230 v, 50 to 60 cyc ac or 12-v storage battery.
- NORMAL A-C POWER CONSUMPTION:** 160 w max.
- NORMAL D-C POWER CONSUMPTION** when using storage battery: 12.5 amp drain.
- STAND-BY POWER:** Storage battery, change-over not automatic.
- TUBE COMPLEMENT:** 4 ea, 2,050; 2 ea OC3VR-105; 11 ea 6G6G.
- LIGHTNING PROTECTION:** Carbon blocks at line switchboard, and loop binding posts.
- RUNNING SPARES:** Tubes, protectors, fuses, vibrator, and relays.
- MONITORING:** Monitor printer jacks provided.
- LEVEL INDICATION:** All operational measurements covered.
- HOUSING:** Hinged rack and panels in wooden case.
- Frequencies:** 1,680 and 1,860, one for ea direction of transmission.
- Line terminations:** 2-wire only.
- Drop and loop terminations:** 2-wire or ground return.
- Tools and test sets required:** Relay adjusting tools, part of TH-1/TCC-1.

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	167	225
Total volume (cu ft).....	6	13.0
Ship tons.....		.35

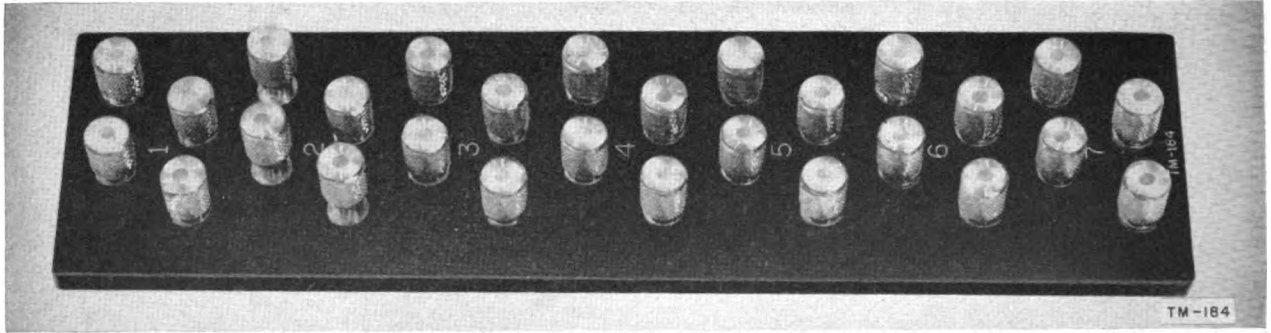


Figure 204. Terminal Strip TM-184.

Status: Standard. *Stock No.:* 4E9304. *Reference:* FM 24-20.

Terminal Strip TM-184 consists of a laminated phenolic strip on which are mounted 28 Binding Posts TM-175. It is equipped with two mounting clamps and four mounting holes. The TM-184 provides termination for seven pairs of wires,

and the TM-184-A provides termination for five pairs of wires.

Terminal Strip TM-184 is used with various Signal Corps equipments. It is used as a terminating or test point in tactical field wire systems.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
2.5	15½	3¾	¾

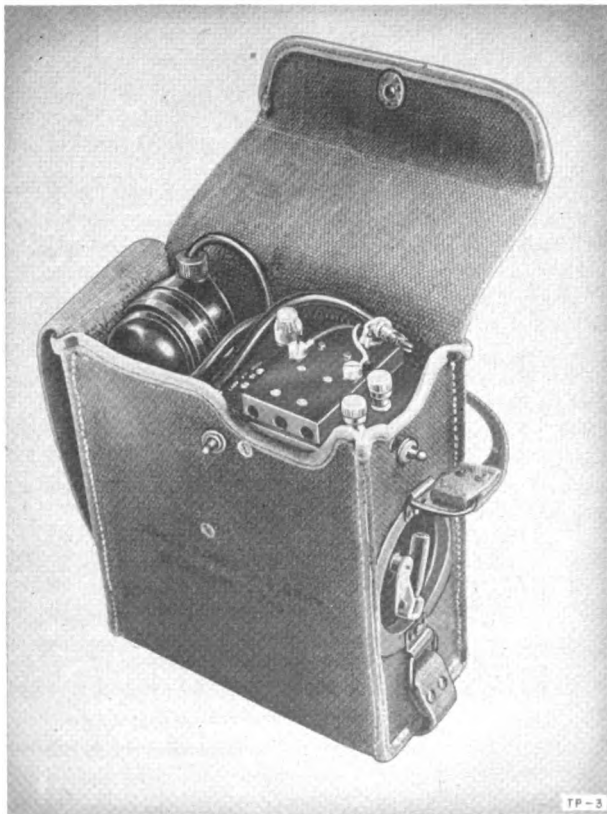


Figure 205. Telephone TP-3.

Status: Substitute/Std. *Stock No.:* 4B5500-3. *Reference:* TM 11-2043.

Telephone TP-3 is a portable, self-contained, sound-powered field telephone. It consists of a body assembly, Handset TS-10-(*), Generator GN-38-B, Ringer MC-131, and a neon lamp, all contained in a heavy canvas case. The TP-3 is a self-contained unit used for two-way signaling and voice communication. It is a sound-powered magneto telephone which requires no batteries or external source of power, and is intended for use on metallic or ground-return circuits composed of field wire or field cable.

Telephone TP-3 is used in the forward areas of the combat zone to furnish telephone communication at the infantry company and platoon levels.

TECHNICAL CHARACTERISTICS

RANGE:

Talking: 15-db net loss circuit.

Ringing: Without repeat coils; 3,000 ohms; with repeat coils; 2,000 ohms.

LINE TERMINATION: 2-wire or ground return.

TRANSMISSION AND RECEIVING EQUIPMENT:

Handset TS-10-(*).

HOUSING: Canvas case.

SIGNALING EQUIPMENT: Hand generator, output 20 cye at 90 v; ringer, 20 cye, and neon lamp.

IMPEDANCE AT 1,000 CYCLES: 600 / 10°.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
8	10	8¾	4¾



Figure 206. Telephone TP-6-A.

Status: Standard. Stock No.: 4B5500-6. Reference TM 11-685.

Telephone TP-6-A is a general purpose, common battery, antisidetone telephone which con-

sists of a handset, base, Cord CC-333, and housing in which are mounted a ringer, coil, capacitor, and lever switch. The housing has a cradle for the handset and provisions for use of a dial, but no dial is issued with this set. The TP-6-A is similar to a commercial telephone desk set but is treated for tropical use.

Telephone TP-6-A is used on common battery telephone lines of Corps, Army, Army groups, communications zone, and zone of the interior telephone systems.

TECHNICAL CHARACTERISTICS

RANGE: 30-db net loss circuit.

POWER SOURCE REQUIRED: 24- to 48-v central office battery.

LINE TERMINATION: 2-wire.

SIGNALING EQUIPMENT: Lever switch; ringer (20 cye).

IMPEDANCE AT 1,000 CYCLES: 550 / 30°.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
5	6	9½	8



Figure 207. Telephone TP-9.

Status: Standard. Stock No.: 4B5500-9. Reference: TM 11-2059.

Telephone TP-9 is a portable, amplifier telephone inclosed in a two-compartment cast-

aluminum immersion-proof case. The lower part of the chassis incloses the amplifiers and batteries. The upper part of the case incloses the ringer and hand generator. A hinged cover attached to the upper case is intended to cover the handset and control equipment mounted on the front of the TP-9. Telephone TP-9 is designed to provide communication over greater distances than those obtained with ordinary local battery sets. This is made possible by the use of vacuum tube amplifiers in both the transmitting and receiving circuits. Provision is made so that the TP-9 may also be used without the amplifiers as a local, battery telephone. When using the amplifiers, transmission may be effected in only one direction at a time. This requires close cooperation of personnel using the equipment for efficient operation.

Telephone TP-9 is used on long nonrepeated tactical telephone circuits where the transmission losses prohibit the use of Telephone EE-8-(*). It is used in the combat and communications zones for special purpose telephone communication circuits, such as forward observer or pipe line circuits.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS:

Transmission: +15 dbm.

Receiving: Gain of receiving amplifiers 55 db.

LOCATION IN SYSTEM: On one or both ends of a point-to-point circuit; or on one end of a long extension from a local battery switchboard.

RANGE: 65-db net loss circuit.

POWER SUPPLY:

Transmitter: Battery BA-27, (4½ v) 1 ea.

Amplifier filament: Battery BA-65, (1½ v) 1 ea.

Amplifier plate: Battery BA-2, (65 v) 3 ea.

TUBE COMPLEMENT: Tube VT-221, 3 ea.

RUNNING SPARES: Tube, 1 ea.

TRANSMISSION AND RECEIVING EQUIPMENT:

Handset TS-9-(*).

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
19	10¾	12½	7¾



Figure 208. Telephone Repeater TP-14.

Status: Standard. Stock No.: 4B3250-14. Reference: TM 11-2007.

Telephone Repeater TP-14 is a portable telephone repeater which consists of amplifiers, equalizers, balancing nets, hybrid arrangements, and a rectifier unit, all inclosed in a wooden case that is moistureproof under ordinary weather conditions but will not stand complete immersion in water. The TP-14 is basically a 2-wire repeater but can be converted to 4-wire operation by simple changes in the external wiring.

Telephone Repeater TP-14 is intended for use on tactical telephone circuits at Corps level or higher. It can be used to good advantage on cable, open wire, or any stabilized wire facility. It can also be used on field wire or unstabilized wire facilities but its range will be limited.

TECHNICAL CHARACTERISTICS

OPERATING LEVELS: Normal output +10 db.

LOCATION IN SYSTEM: At ends or intermediate points of long telephone transmission circuit.

RANGE: Gain in ea direction, 0 to 18 db.

POWER REQUIRED: 110 to 130 v, 220 to 230 v, 50 to 60 cyc; 12-v storage battery; 135-v and 12-v dry cells.

NORMAL A-C POWER CONSUMPTION: 11 w.

NORMAL D-C POWER CONSUMPTION: Storage battery—800 ma; dry cells—170 ma.

LIGHTNING PROTECTION: Carbon blocks at 2-wire terminals, additional protection required for 4-wire operation.

TUBE COMPLEMENT: 2 ea 6G6-G (VT-198-A).

RUNNING SPARES: Tubes, fuses, and vibrator.

MONITORING: Monitoring receiver and terminals on face of equipment.

LEVEL INDICATION: Check for ringing margin.

FREQUENCIES: V-f band.

LINE TERMINATIONS: 2-wire or 4-wire.

SIGNALING CIRCUIT: Contains 20-cyc ringing bypass circuit.

Note. Simplex arrangement provided. Simplex terminal on face of equipment.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
46	11	17½	8



Figure 209. Handset TS-9.

Status: Standard. *Stock No.:* 4B1109. *Reference:* TM 11-333.

Handset TS-9-(*) represents all models of the TS-9. Handset TS-9-(*) is a telephone handset which consists of a receiver element, a transmitter element, a butterfly switch, and Cord CC-333, all inclosed or attached to a molded black phenolic handle.

Handset TS-9-(*) is used as the receiving and transmitting equipment of Telephones EE-8-(*), TP-9, and EE-91. It is intended for use with local battery telephones and local battery switchboards in field wire systems at the combat zone level. Actually, it is used throughout the Army wherever a handset of the type and capabilities of the TS-9-(*) is required.

TECHNICAL CHARACTERISTICS

TRANSMITTER:

Type: Cartridge microphone.
Resistance: 50 ohms.
Voltage of power source: 3 v.

RECEIVER:

Type: Compensated magnetic.
Impedance: 256 ohms.
Max output frequency: 600 to 1,600 cyc.

CORD:

Number of conductors: 3.
Termination: Spade terminals or Plug PL-58.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Length (in.)
1. 1	2 $\frac{1}{4}$	3 $\frac{3}{16}$	9 $\frac{1}{16}$

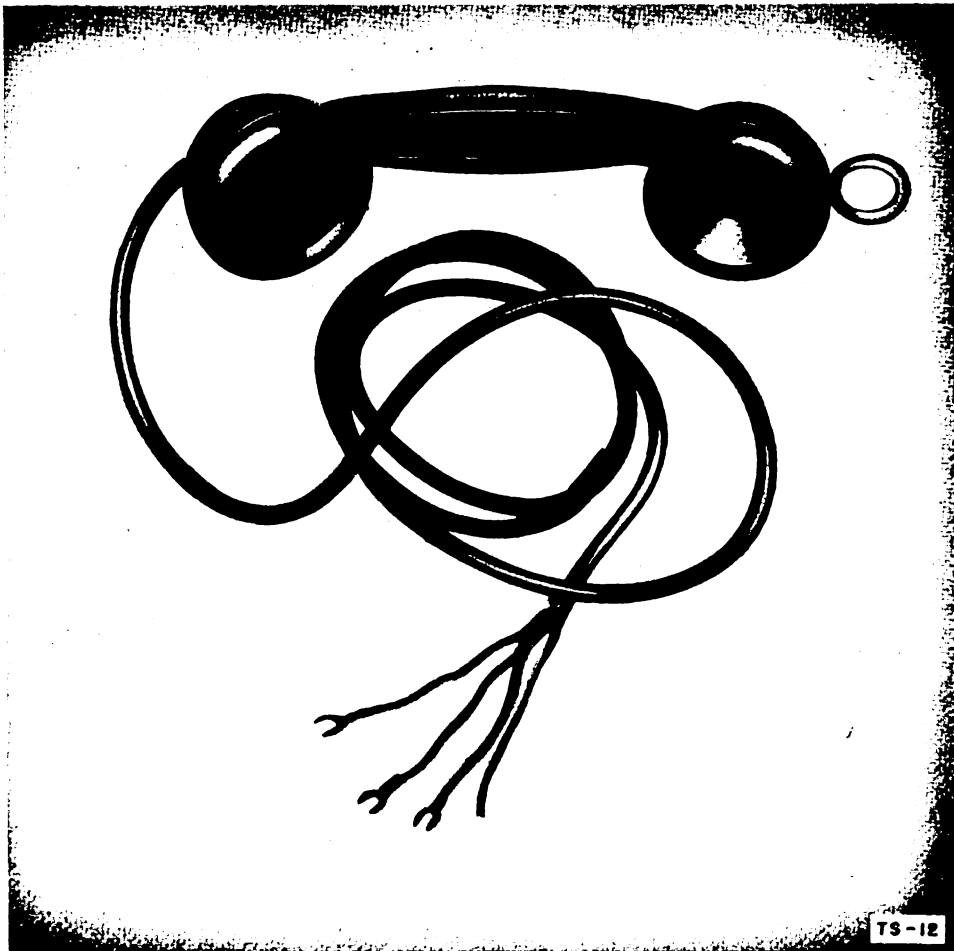


Figure 210. Handset TS-12-A.

Status: Standard. *Stock No.:* 4B1112A (TS-12-A) and 4B1112F (TS-12-F).

Handset TS-12-(*) represents TS-12-A and TS-12-F. Handset TS-12-(*) is a telephone handset which consists of a receiver element, a transmitter element, a butterfly switch, Cord CC-333, and Hanger FT-155-A, all inclosed or attached to a molded black phenolic handle.

Handset TS-12-(*) is used as the receiving and transmitting equipment of Telephone EE-91. It is intended for use with Telephone EE-91 in the fire-control telephone systems of fixed harbor defense installations in the zone of the interior or at oversea installations.

TECHNICAL CHARACTERISTICS

TRANSMITTER: Cartridge type microphone; impedance is 50 ohms.

RECEIVER: Compensated magnetic (controlled damped diaphragm) type unit.

RECEIVER IMPEDANCE: 256 ohms.

MAX RECEIVER OUTPUT FREQUENCY: 600 to 1,600 cye.

NUMBER OF CONDUCTORS IN CORD: 3.

TERMINATION OF CORD: Spade terminals or Plug PL-58.

WEIGHT AND DIMENSIONS

<i>Weight (lb.)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Length (in.)</i>
1.1	2 $\frac{3}{4}$	3 $\frac{5}{16}$	9 $\frac{1}{16}$

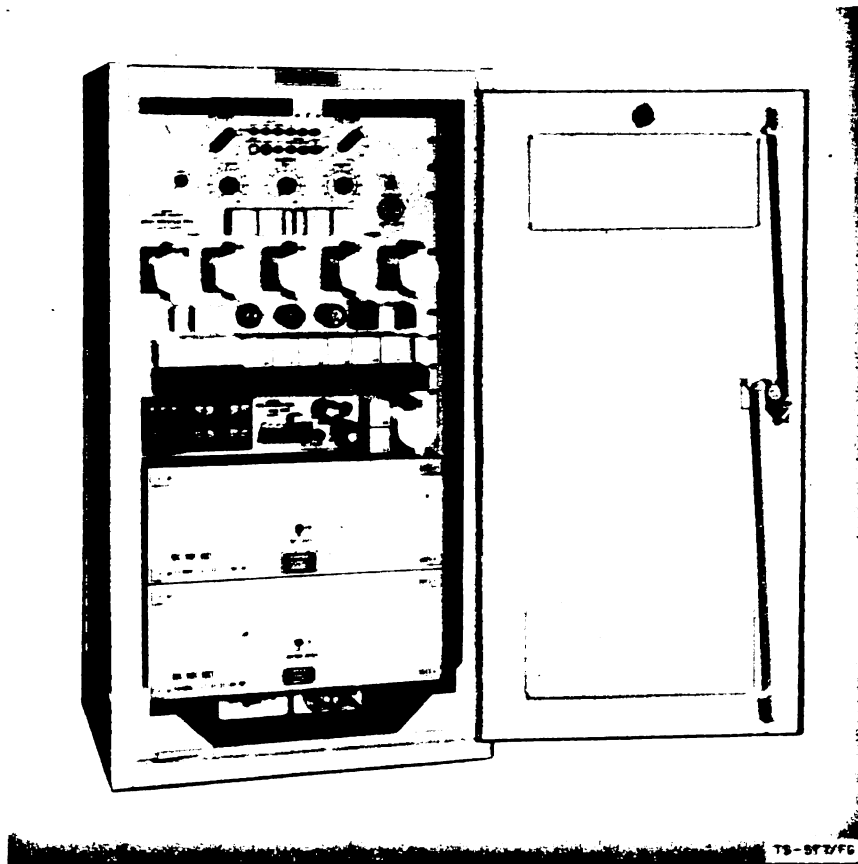


Figure 211. Telegraph Monitor TS-577/FG

Status: Standard. *Stock No.:* 4A1485. *Reference:* TM 11-2053.

Telegraph Monitor TS-577/FG is contained in a light, gray-finished steel cabinet, equipped with full-length doors in front and rear. The TS-577/FG consists of a monitoring set panel, fuse and alarm panel, and two rectifiers. The TS-577/FG gives automatic telegraph monitoring service and is used for continuous monitoring of telegraph signals in the local or d-c loop circuits of telegraph terminals and repeaters. The monitoring set is connected in series in the d-c circuit, similar to a teletypewriter, and observes each signal (marking or spacing). It measures the length of each signal to determine the amount of distortion. If more than a certain number of distorted signals are registered in a given time-interval, an alarm is sounded. In this way it provides an indication of the times at which the quality of the transmitted signals has decreased so that telegraph service is unsatisfactory or likely to become so. This is accomplished without re-

quiring the continuous attention of an operator.

Telegraph Monitor TS-577/FG is intended for use in the fixed-plant telegraph transmission systems of permanent or semipermanent installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

TYPE OF OPERATION: Will respond to neutral 60 ma or polar +30 and -30 ma signals.

SPEED OF OPERATION: 60, 75, 100, 120 words per min.

POWER SUPPLY: 115 to 230 v, 50 to 60 cyc ac.

NORMAL POWER CONSUMPTION: 300 w.

TUBE COMPLEMENT: 3 ea JAN-2050; 2 ea 394A.

LINE PROTECTION: Fuses.

RUNNING SPARES: Tubes, relays, and fuses.

MONITORING: Continuous.

LINE TERMINATION: 2-wire.

TEST SET AND TOOLS REQUIRED: Test Set I-181 and relay adjusting tools.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
300	42	22 $\frac{1}{4}$	17



Figure 212. Teletypewriter TT-4/TG.

Status: Standard.

Teletypewriter TT-4/TG is a portable, man-packed, immersion-proof teletypewriter set that can be packed on a regular Quartermaster pack board by one man. It is inclosed in a metal case which is finished in olive drab, and it is developed especially for tactical use. The TT-4/TG is a page-receiving and keyboard-sending teletypewriter, equipped with a standard communication keyboard.

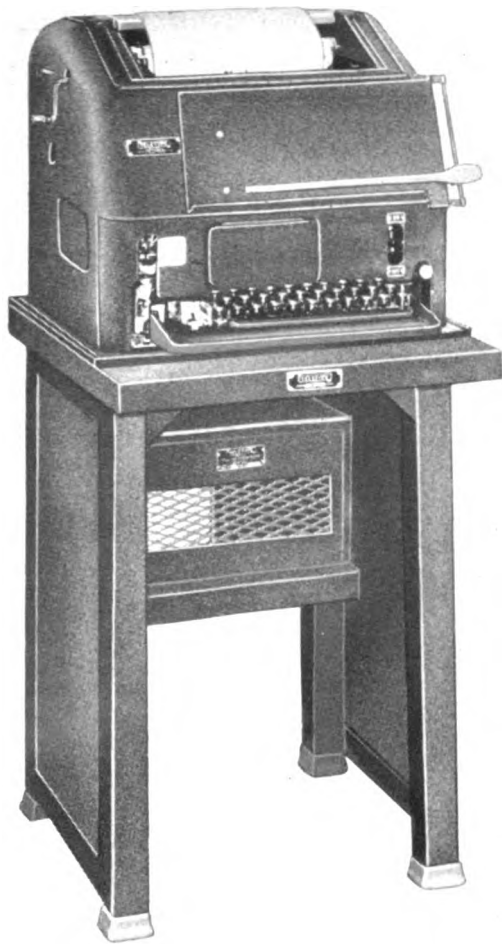
Teletypewriter TT-4/TG is intended for use in the tactical teletypewriter nets of the forward areas of the combat zone and is a component part of Teletypewriter Set AN/PGC-1.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type 20- to 60-ma circuit, 5-unit start-stop teletypewriter code.
 POWER REQUIREMENTS: 115 v, 50 to 60 cyc ac or 115 v, dc.
 SPEED OF OPERATION: 60 speed (368 opm); 66 speed (404 opm).
 CHARACTERS PER LINE: 72.
 RANGE: 25 mi of Wire W-110-B (wet) simplex.
 MOTOR STOP: On upper case H.
 BELL SIGNAL: On upper case S.

WEIGHT

	<i>Unpacked</i>
Total weight (lb).....	47



TT-5/FG

Figure 213. Teletypewriter TT-5/FG.

Status: Standard. Stock No.: 4T2.18A-1.
Reference: TM 11-2215.

Teletypewriter TT-5/FG is a fixed-plant teletypewriter designed to interchange typewritten messages by electrical means between two or more points. The TT-5/FG is a page-receiving and

keyboard-sending teletypewriter equipped with a standard communication keyboard, a type-bar arrangement, a pulling magnet selector, and a line relay. It has a series-governed, a-c motor controlled by switch or automatic built-in control and a remote stop on the H key. The TT-5/FG has a rectifier for local and/or line current with a built-in transformer for 95- to 125-, and 190- to 250-v, 25 to 60 cps, a-c input, including a variable-tap winding for adjusting the motor terminal voltage (a-c). All the equipment has a black wrinkle finish and is mounted on a metal table.

Teletypewriter TT-5/FG is intended for use in fixed-plant teletypewriter systems of permanent or semipermanent installations in the communications zone or the zone of the interior.

TECHNICAL CHARACTERISTICS

- LINE OPERATION: Neutral type, 60-ma; 5-unit stop-start teletypewriter code.
POWER REQUIREMENTS: Motor; 115 v, 50 to 60 cyc ac Rectifier; 95 to 125 v or 190 to 250 v, 25 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: 195 w.
SPEED OF OPERATION: 60 wpm (368 opm); 66 wpm (404 opm).
CHARACTERS PER LINE: 72.

PRINCIPAL COMPONENTS

Component	Quantity
Speed indicator	1
Table	1
Base with radio filters	1
Motor, a-c	1
Plate cover	1
Rectifier	1
Relay, telegraph, polar	1
Typing unit	1
Copyholder	1
Gear set (368 opm)	1
Keyboard unit	1
Cover	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	215	450
Total volume (cu ft)	15	35
Ship tons		.9



Figure 214. Teletypewriter TT-6/FG.

Status: Standard. Stock No.: 4T2.16A-1.
Reference: TM 11-2215.

Teletypewriter TT-6/FG is a fixed-plant teletypewriter designed to interchange weather symbols and typewritten messages by electrical means between two or more points. The TT-6/FG is a

page-receiving and keyboard-sending teletypewriter equipped with a weather communication keyboard, a type-bar arrangement, a pulling magnet selector, and a line relay. It has a series-governed, a-c motor controlled by a switch and a remote stop on H key. The TT-6/FG has a rectifier for local and/or line current with a built-in transformer for 95- to 125-, and 190- to 250-v, 25 to 60 cps, a-c input, including a variable-tap winding for adjusting the motor terminal voltage. All the equipment has a black wrinkle finish and is mounted on a metal table.

Teletypewriter TT-6/FG is intended for use in fixed-plant teletypewriter systems of weather-reporting networks in permanent or semipermanent installations of the communications zone or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, 60-ma; 5-unit stop-start teletypewriter code.

POWER REQUIREMENTS: Motor; 115 v, 50 to 60 cyc ac Rectifier; 95 to 125 v or 190 to 250 v, 25 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 195 w.

SPEED OF OPERATION: 60 speed (368 opm); 66 speed (404 opm).

CHARACTERS PER LINE: 76.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Speed indicator.....	1
Table.....	1
Base and radio filters.....	1
Motor, a-c.....	1
Plate cover.....	1
Rectifier.....	1
Relay, telegraph, polar.....	1
Typing unit.....	1
Copyholder.....	1
Gear set (368 opm).....	1
Keyboard unit.....	1
Cover.....	1

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	215	450
Total volume (cu ft).....	15	35
Ship tons.....		.9



Figure 215. Teletypewriter TT-7/FG.

Status: Standard. *Stock No.:* 4T4.15A-1. *Reference:* TM 11-2216.

Teletypewriter TT-7/FG is a fixed-plant teletypewriter designed to interchange typewritten messages by electrical means between two or more points. The TT-7/FG is a page-receiving, keyboard-sending, and tape-perforating teletypewriter mounted on a metal table with a transmitter-distributor for tape sending. It is equipped with a standard communication keyboard and type-bar arrangement and a character counter printer and dial at the left of keyboard. The motors in the teletypewriter and the transmitter-distributor are a-c, series-governed, and adjustable for 60- or 66-speed operation. The motors are controlled by a switch and an automatic motor control and a remote stop on the H key. The table for mounting the teletypewriter and transmitter-distributor also mounts a rectifier that supplies dc for local circuits.

Teletypewriter TT-7/FG is used in fixed-plant teletypewriter systems of the communications zone or in the zone of the interior to increase the traffic handling capacity of the system and still retain the flexibility and simplicity of a neutral type telegraph system.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, 60-ma; 5-unit start-stop teletypewriter code.

POWER SUPPLY: Motor; 115 v, 50 to 60 cyc ac Rectifier; 95 to 125 v or 190 to 250 v, 25 to 60 cyc ac.

NORMAL A-C POWER CONSUMPTION: 420 w.

SPEED OF OPERATION: 60 speed (368 opm); 66 speed (404 opm).

CHARACTERS PER LINE: 72.

PRINCIPAL COMPONENTS

<i>Component</i>	<i>Quantity</i>
Speed indicator.....	1
Table.....	1
Base with radio filters.....	1
Motor, a-c.....	1
Perforator transmitter.....	1
Relay, telegraph, polar.....	1
Rectifier.....	1
Typing unit.....	1
Copyholder.....	1
Cover, perforator.....	1
Gear set (368 opm).....	1
Transmitter-distributor.....	1

WEIGHT AND VOLUME

	<i>Unpacked</i>	<i>Export pack</i>
Total weight (lb).....	405	775
Total volume (cu ft).....	21	59
Ship tons.....		1.5



Figure 216. Teletypewriter TT-8/FG.

Status: Standard. Stock No.: 4T4.13A-1. Reference: TM 11-2216.

Teletypewriter TT-8/FG is a fixed-plant teletypewriter designed to interchange weather symbols and typewritten messages by electrical means between two or more points. The TT-8/FG is a page-receiving, keyboard-sending, and tape-perforating teletypewriter mounted on a metal table with a transmitter-distributor for tape sending. It is equipped with a weather communication keyboard and type-bar arrangement, character counter printer and dial at the left of the keyboard. The motors in the teletypewriter and the transmitter-distributor are a-c, series-governed, and adjustable for 60- or 66-speed operation. The motors are controlled by a switch and a remotestop on the H key. The table for mounting the teletypewriter and transmitter-distributor also mounts a rectifier that supplies dc for the local circuits.

Teletypewriter TT-8/FG is used in fixed-plant teletypewriter systems of weather reporting networks of the communications zone or in the zone of the interior to increase the traffic-handling capacity of the system and still retain the flexibility and simplicity of a neutral type telegraph system.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type, 60-ma; 5-unit start-stop teletypewriter code.
 POWER SUPPLY: Motor; 115 v, 50 to 60 cyc ac Rectifier; 95 to 125 v or 190 to 250 v, 25 to 60 cyc ac.
 NORMAL A-C POWER CONSUMPTION: 420 w.
 SPEED OF OPERATION: 60 speed (368 opm); 66 speed (404 opm).
 CHARACTERS PER LINE: 76.

PRINCIPAL COMPONENTS

Component	Quantity
Speed indicator.....	1
Table.....	1
Base with radio filter.....	1
Motor, a-c.....	1
Perforator transmitter.....	1
Relay, telegraph, polar.....	1
Rectifier.....	1
Typing unit.....	1
Copyholder.....	1
Cover, perforator.....	1
Gear set (368 opm).....	1
Transmitter-distributor.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	405	775
Total volume (cu ft).....	21	59
Ship tons.....		1.5

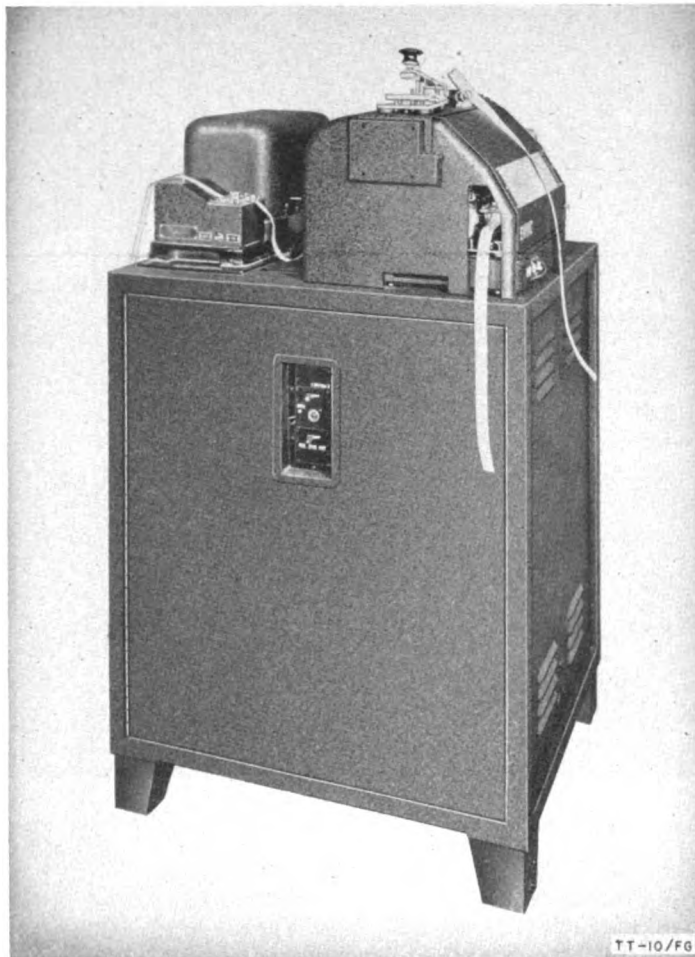


Figure 217. Teletypewriter TT-10/FG.

Status: Limited/Std. Stock No.: 4TW132A2.
Reference: TM 11-2210.

Teletypewriter TT-10/FG is a cabinet type table with a receiving-only typing reperforator, equipped with a synchronizing circuit for receiving from a radio channel, and a transmitter-distributor for sending to a radio transmitter or a wire circuit. The typing reperforator has a holding-magnet selector, and the transmitter-distributor and typing reperforator are supplied with an a-c, series-governed motor.

Teletypewriter TT-10/FG is used in fixed-plant, wire and radio, teletypewriter systems of permanent or semipermanent installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type telegraph, 20- or 60-ma circuit; polar type telegraph, 10- or 30-ma circuit.
POWER SUPPLY: Motor; 115 v, 50 to 60 cyc ac rectifier; 95 to 125 v or 190 to 250 v, 25 to 60 cyc ac.
NORMAL A-C POWER CONSUMPTION: 290 w.
SPEED OF OPERATION: 60 speed (368 opm).

PRINCIPAL COMPONENTS

Component	Quantity
Table, WECo type 132A2	1
Typing reperforator, Teletype part FPR21GB226 ..	1
Power supply, WECo KS-5888	1
Transmitter-distributor, Teletype part XD86FR	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	400	650
Total volume (cu ft)	30	34
Ship tons .....		.9

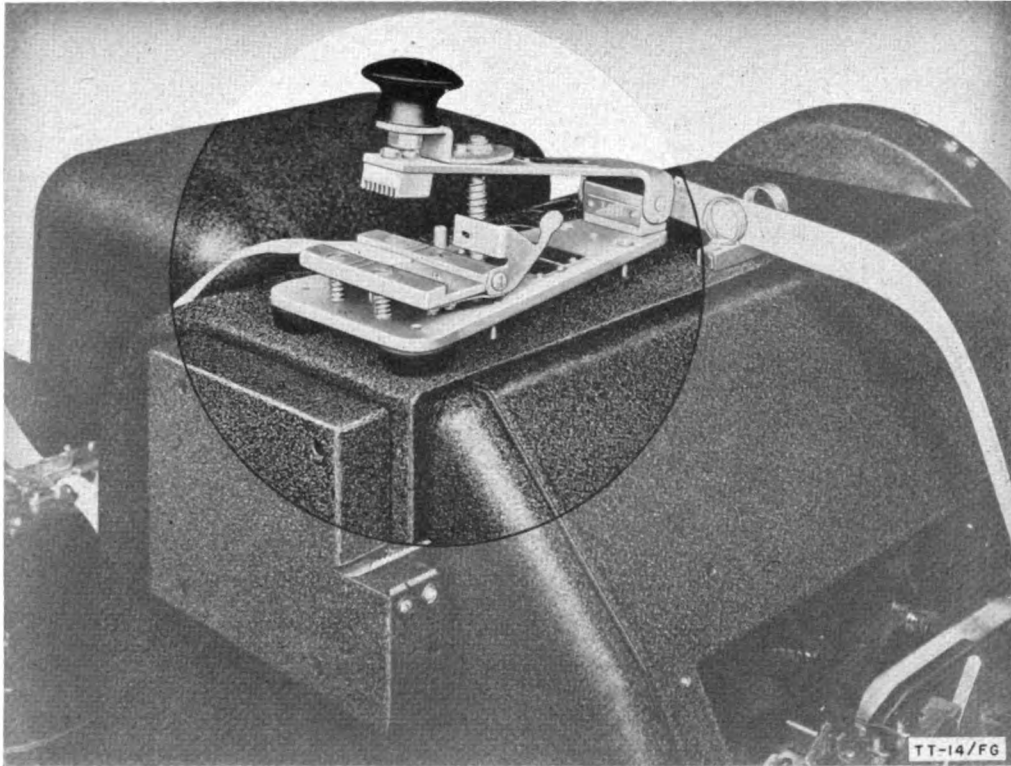


Figure 218. Splicer TT-14/FG.

Status: Standard. *Stock No.:* 4TW61859-19.
Reference: TM 11-2210.

Splicer TT-14/FG is a device composed of a metal base, an arm, and a plastic knob. The TT-14/FG is used with single tape transmitter-distributors and includes a number tab dispenser and bracket assembly.

Splicer TT-14/FG is used to join message tapes so that continuous transmission over the transmission circuits may be obtained. The number tab dispenser is attached to the splicer bracket and is

used for holding a roll of perforated tape made up of consecutive numbers with sufficient letters characters between the numbers so that a number tab can be pulled out of the dispenser, torn off, and spliced to the beginning of a message tape. This is done so that a message can be properly identified in case a rerun is necessary. The TT-14/FG is used with Teletypewriter Set TT-10/FG.

WEIGHT AND DIMENSIONS

<i>Weight (lb.)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Length (in.)</i>
5	4	4	7

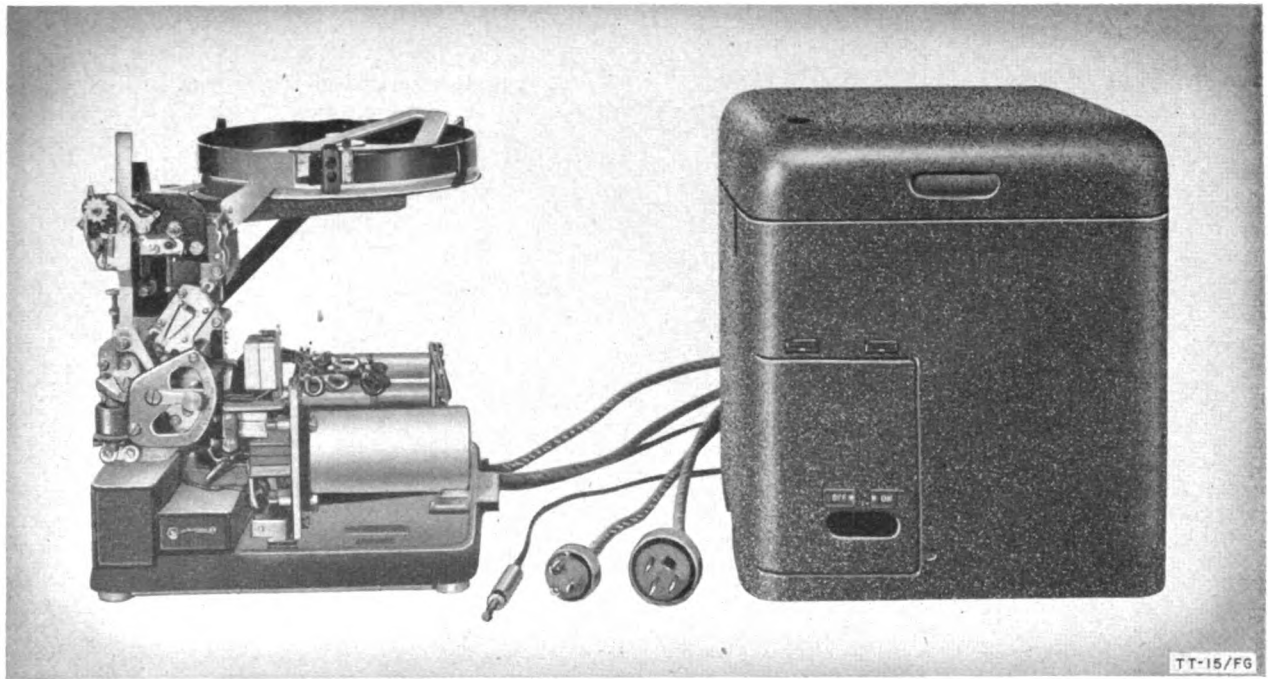


Figure 219. Reperforator TT-15/FG.

Status: Standard. Stock No.: 4T9.2-1. Reference: TM 11-2223.

Reperforator TT-15/FG is a nontyping, motor-driven machine that receives messages in the form of electrical impulses and records the message in code perforations on paper tape. This tape can then be fed into a transmitter-distributor for transmission to a line circuit. The TT-15/FG is connected to other teletypewriter equipment and is not capable of operating by itself.

Reperforator TT-15/FG is used as a monitoring set with Teletypewriter TT-7/FG. It is used in fixed-plant teletypewriter systems of permanent or semipermanent installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: 110 v, 50 to 60 cyc ac.
 SPEED OF OPERATION: 60 speed (368 opm).
 TAPE: Fully perforated.

PRINCIPAL COMPONENTS

Component	Quantity
Reperforator unit, RPE26.....	1
Motor unit.....	1
Gear (368 opm).....	1
Cover C-122.....	1
Table RT-34.....	1
Speed indicator, 87.6 vps.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	134	180
Total volume (cu ft).....	4.5	7
Ship tons.....		.1

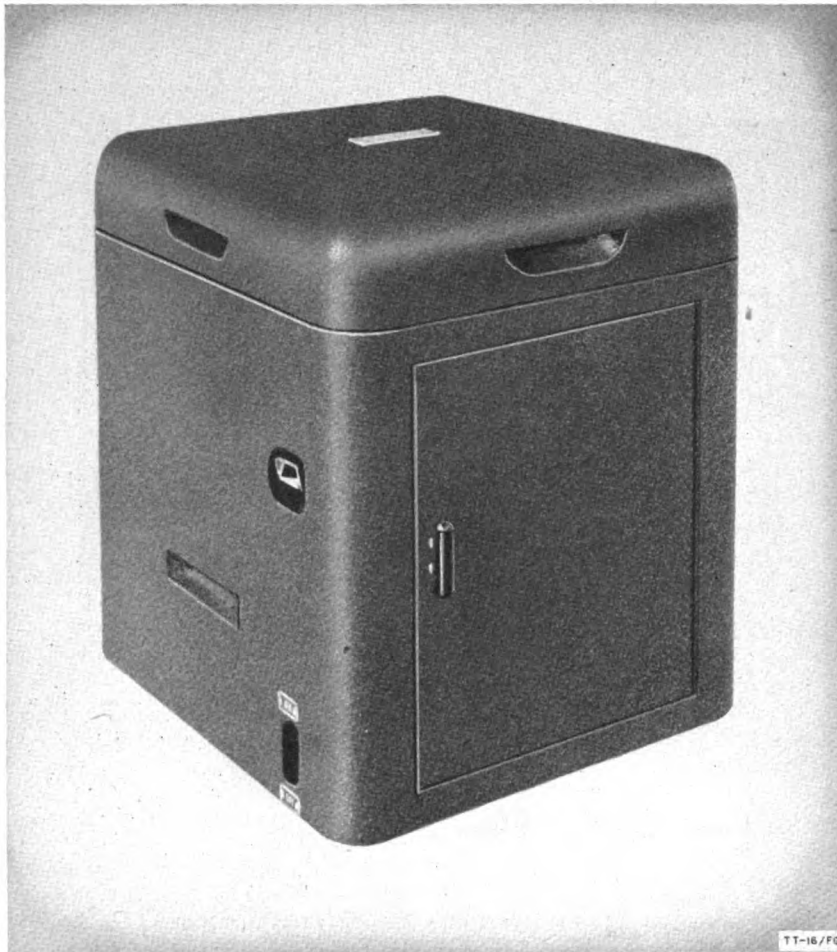


Figure 220. Reperforator TT-16/FG.

Status: Standard. Stock No.: 4T10.4A-3. Reference: TM 11-2223.

Reperforator TT-16/FG is a typing, motor-driven machine that receives messages in the form of electrical impulses and records the message in code perforations and typewritten form on paper tape. This tape can then be fed into a transmitter-distributor for transmission to a line circuit. The TT-16/FG is connected to other teletypewriter equipment and is not capable of operating by itself.

Reperforator TT-16/FG is used as a monitoring set with Teletypewriter TT-7/FG. Its advantage is that it permits a check of the text of the message and rapid retransmission by transmitter-distributor, if relay of message is desired. The TT-16/FG is used in fixed-plant teletypewriter systems of permanent or semipermanent installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: 110 v, 50 to 60 cyc ac.
 SPEED OF OPERATION: 60 speed (368 opm).
 TAPE: Chadless.
 KEYBOARD: Standard.

PRINCIPAL COMPONENTS

Component	Quantity
Reperforator unit, FPR23GB226.....	1
Motor unit.....	1
Gear (368 opm).....	1
Cover C-168.....	1
Speed indicator, 87.6 vps.....	1
Motor-switch assembly.....	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	62.5	150
Total volume (cu ft).....	1.5	9.8
Ship tons.....		.25

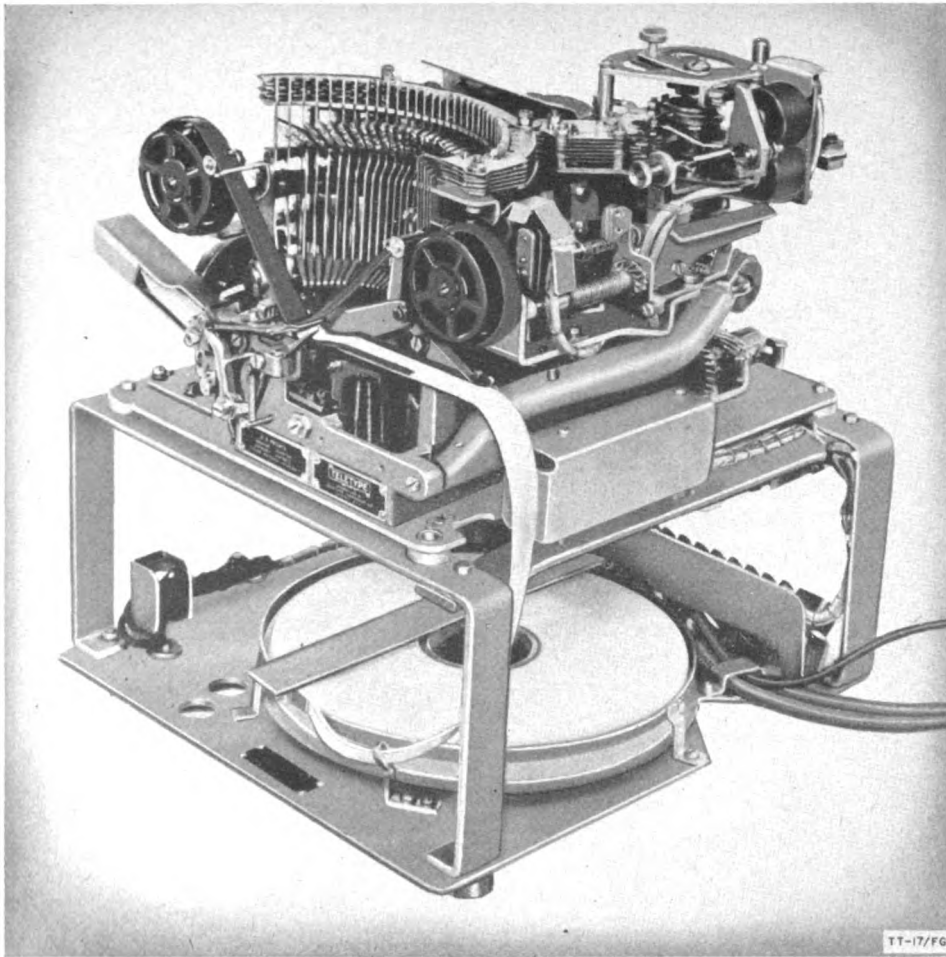


Figure 221. Reperforator TT-17/FG.

Status: Standard. Stock No.: 4T10.5A-3. Reference: TM 11-2223.

Reperforator TT-17/FG is a typing, motor-driven machine that receives messages in the form of electrical impulses and records the message in code perforations, weather symbols, and typewritten form on paper tape. This tape can then be fed into a transmitter-distributor for transmission to a line circuit. The TT-17/FG is connected to other teletypewriter equipment and is not capable of operating by itself.

Reperforator TT-17/FG is used as a monitoring set with Teletypewriter TT-8/FG in weather communication teletypewriter systems. Its advantages are that it permits a check of the text of the message and rapid retransmission by transmitter-distributor, if relay of message is desired. The TT-17/FG is used in fixed-plant weather communication teletypewriter systems of permanent or semipermanent installations in the communica-

tions zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER REQUIRED: 110 v, 50 to 60 cyc ac.
 SPEED OF OPERATION: 60 speed (368 opm).
 TAPE: Chadless.
 KEYBOARD: Weather communication.

PRINCIPAL COMPONENTS

Component	Quantity
Reperforator unit, FPR23GB222	1
Motor unit	1
Gear set (368 opm)	1
Cover C-168	1
Speed indicator, 87.6 vps	1
Motor-switch assembly	1

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb)	62.5	150
Total volume (cu ft)	1.5	9.8
Ship tons		.25

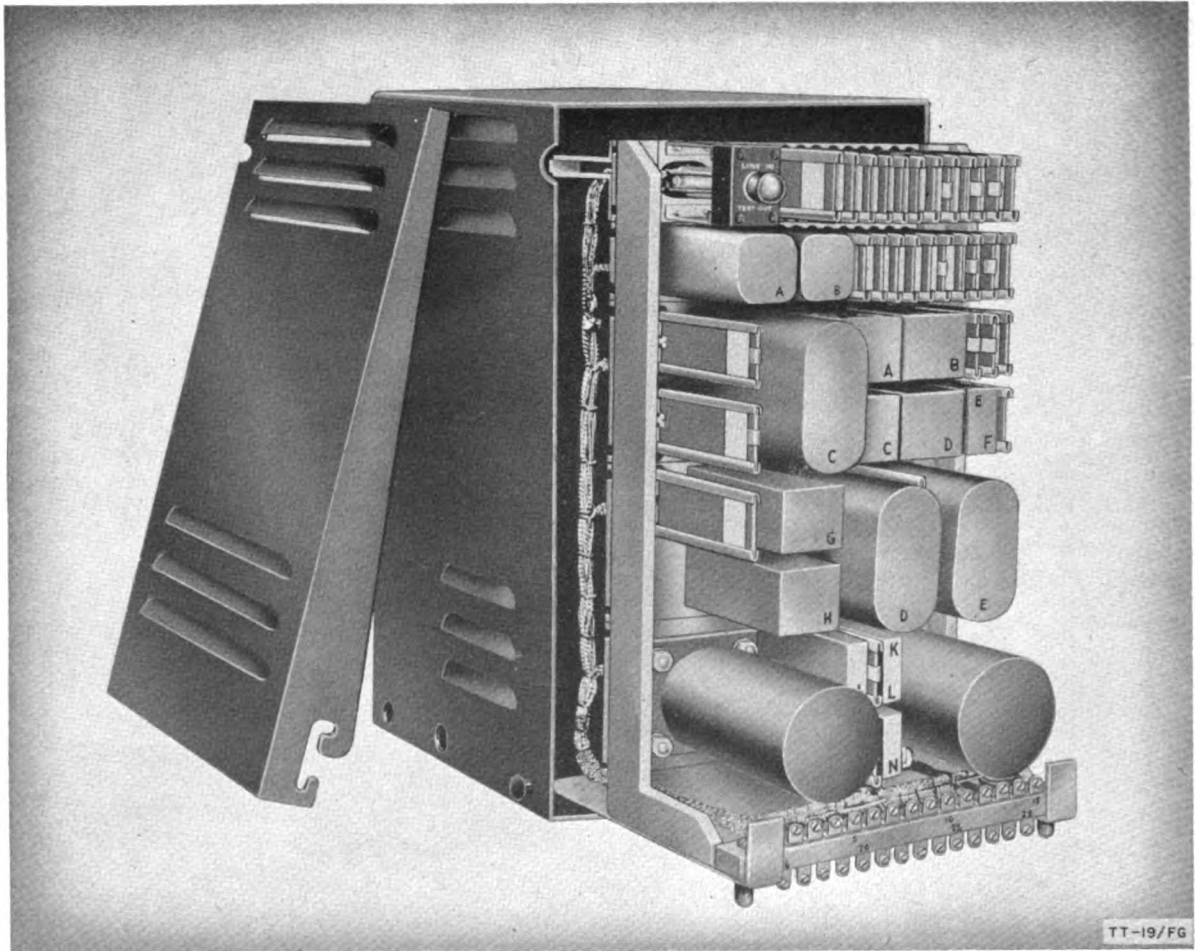


Figure 222. Teletypewriter Repeater TT-19/FG.

Status: Standard. *Stock No.:* 4TW128C2-1.

Teletypewriter Repeater TT-19/FG is a commercial type (WECO 128C2), single-channel, d-c teletypewriter repeater inclosed in a black-finished metal case. The TT-19/FG is intended to be wall-mounted, and the case is equipped with four $\frac{1}{4}$ -inch holes for this purpose.

Teletypewriter Repeater TT-19/FG is used in the zone of the interior. It is installed at the Army user's end of a commercial circuit to change the polarential type of line operation to a neutral type of local operation which is used in Army teletypewriter equipment.

TECHNICAL CHARACTERISTICS

OPERATION:

Line: Polarential.

Local: Neutral, 60-ma circuit.

Speed: 60 speed (368 opm); 66 speed (404 opm).

POWER:

Source required: 75 to 85 v dc.

Drain: 185 ma.

RANGE: Approx doubles transmission range for a given wire facility.

AUXILIARY EQUIPMENT REQUIRED: Rectifier, WECO J86205J.

Note. Not supplied with r-f suppression circuit.

WEIGHT AND DIMENSIONS

<i>Weight (lb.)</i>	<i>Height (in.)</i>	<i>Width (in.)</i>	<i>Depth (in.)</i>
50	14	9	8

Note. Not intended for export shipment.

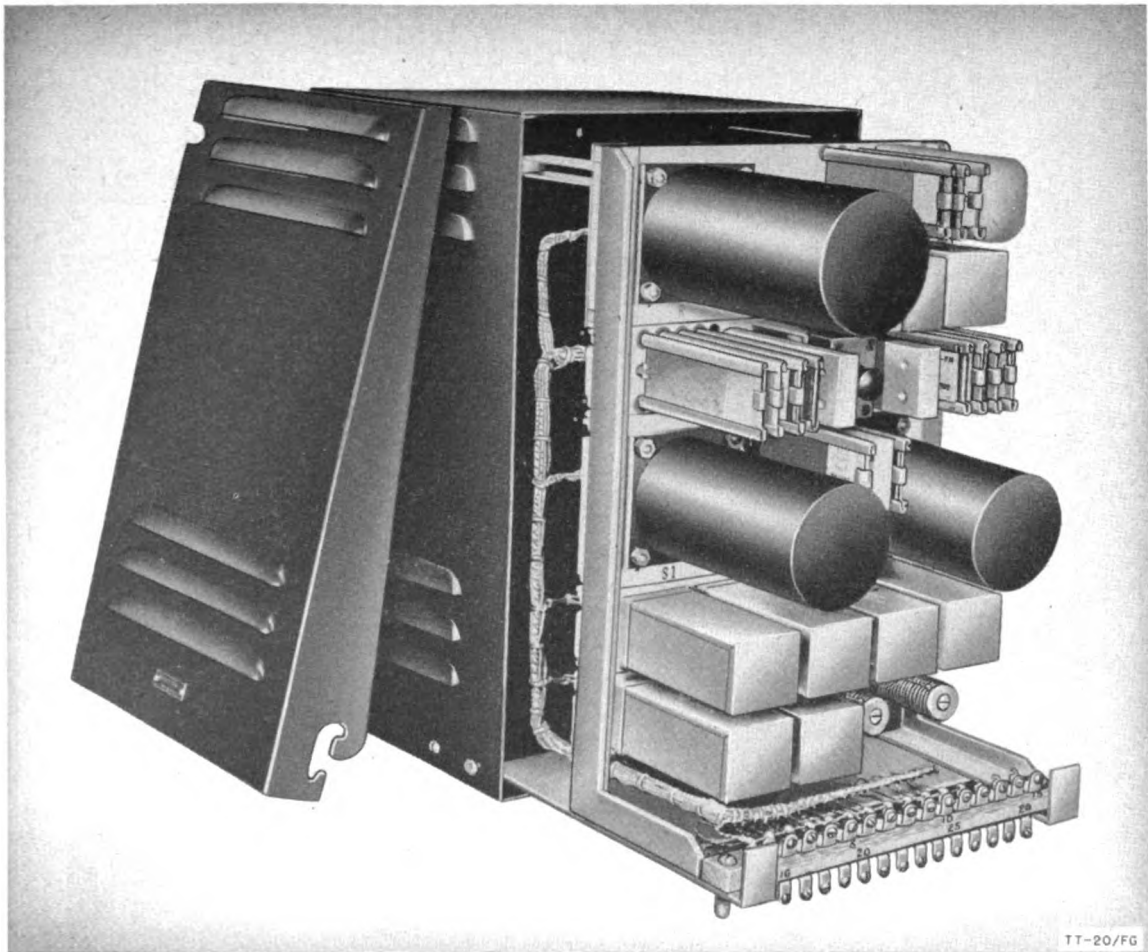


Figure 223. Teletypewriter Repeater TT-20/FG.

Status: Standard. *Stock No.:* 4TW128C2-2.

Teletypewriter Repeater TT-20/FG is a commercial type (WECO 128B2), single-channel, d-c teletypewriter repeater inclosed in a black-finished metal case. The TT-20/FG is intended to be wall-mounted, and the case is equipped with four $\frac{1}{4}$ -inch holes for this purpose.

Teletypewriter Repeater TT-20/FG is used in the zone of the interior. It is installed at the Army user's end of a commercial circuit to change the polarential type of line operation to a neutral type of local operation which is used in Army teletypewriter equipment.

TECHNICAL CHARACTERISTICS

OPERATION:

Line: Polarential.

Local: Neutral, 60-ma circuit.

Speed: 60 speed (368 opm); 66 speed (404 opm).

POWER:

Source required: 130 v dc.

Drain: 190 ma.

RANGE: Approx doubles transmission range for a given wire facility.

AUXILIARY EQUIPMENT REQUIRED: Rectifier with 130 v d-c output.

Note. Not supplied with r-f suppression circuit.

WEIGHT AND DIMENSIONS

Weight (lb.)	Height (in.)	Width (in.)	Depth (in.)
48	16	9	8

Note. Not intended for export shipment.

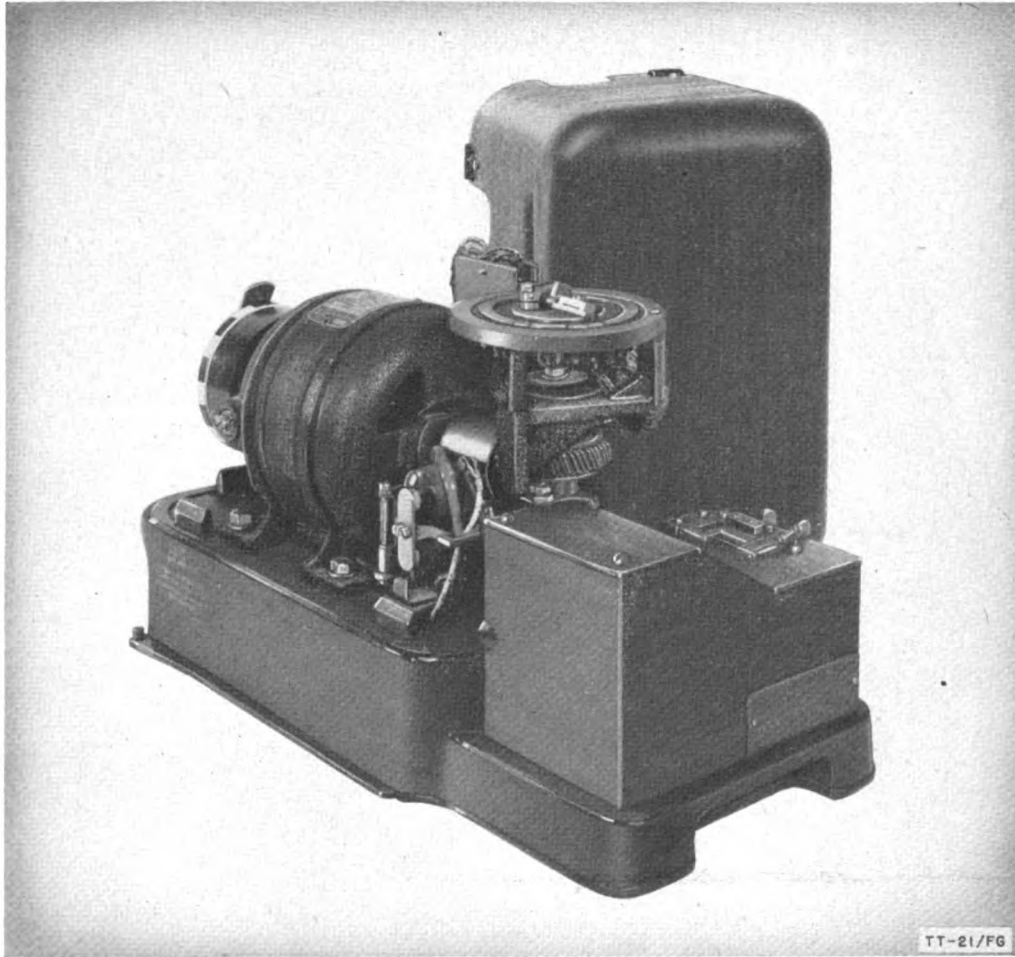


Figure 224. Transmitter-Distributor TT-21/FG.

Status: Standard. *Stock No.:* 4TXD100GW.
Reference: TB 11-2221-1.

Transmitter-Distributor TT-21/FG is a single-channel, motor-driven device which consists of a tape sensing, tape feeding, tape feed suppression, and a transmitting mechanism and distributor motor inclosed inside a metal cover. The TT-21/FG is equipped with a special start magnet, power and line cords, and end-of-line stop mechanism. The TT-21/FG translates code combinations from tape into electrical impulses. These impulses are combined with impulses from an external source and these combined signals are transmitted out to the line. At the distant end, another Transmitter-Distributor TT-21/FG is required to properly terminate the teletypewriter circuit. Transmitter-Distributor TT-21/FG is identical with Transmitter-Distributor TT-25/FG except that the TT-21/FG has added a tape feed suppression mechanism and a new walnut snap

panel. The tape feed suppression mechanism provides a means of suppressing the stepping action of the tape feed mechanism one step each time a lever extending from the side of the snap panel is depressed manually.

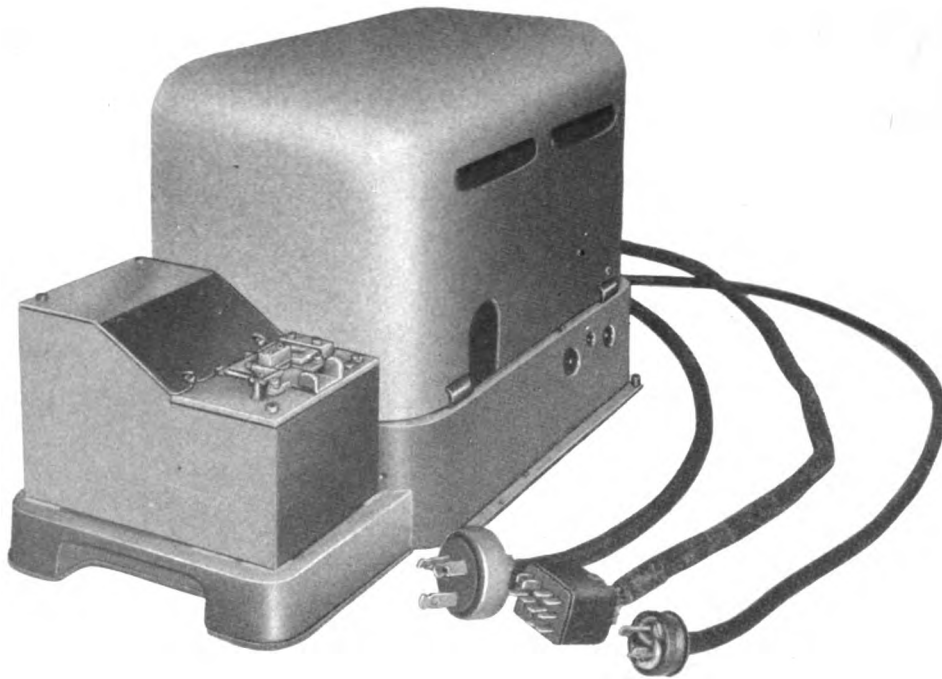
Transmitter-Distributor TT-21/FG is used in conjunction with privacy equipment to provide communication security on certain teletypewriter circuits of fixed-plant installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER SUPPLY REQUIRED: 110 v, 60 cyc ac.
 SPEED OF OPERATION: 420 opm.
 TAPE: Chadless or fully perforated, $\frac{1}{16}$ in. wide.

WEIGHT AND DIMENSIONS

Weight (lb.)	Length (in.)	Width (in.)	Height (in.)
31	15½	9	8½



TT-25/FG

Figure 225. Transmitter-Distributor TT-25/FG.

Status: Standard. *Stock No.:* 4TWXD95GW.
Reference: TM 11-2221.

Transmitter-Distributor TT-25/FG is a single-channel, motor-driven device which consists of a tape sensing, tape feeding, and a transmitting mechanism and distributor motor inclosed inside a metal cover. The TT-25/FG is equipped with a special start magnet, power and line cords, and end-of-line stop mechanism. The TT-25/FG translates code combinations from tape into electrical impulses. These impulses are combined with impulses from an external source and these combined signals are transmitted out to the line. At the distant end, another Transmitter-Distributor TT-25/FG is required to properly terminate the teletypewriter circuit.

Transmitter-Distributor TT-25/FG is used in conjunction with privacy equipment to provide communication security on certain teletypewriter circuits of fixed-plant installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

POWER SUPPLY REQUIRED: 110 v, 60 cyc ac.

SPEED OF OPERATION: 420 opm.

TAPE: Chadless or fully perforated, $\frac{11}{16}$ in. wide.

WEIGHT AND DIMENSIONS

<i>Weight (lb.)</i>	<i>Length (in.)</i>	<i>Width (in.)</i>	<i>Height (in.)</i>
33	15½	8¾	9

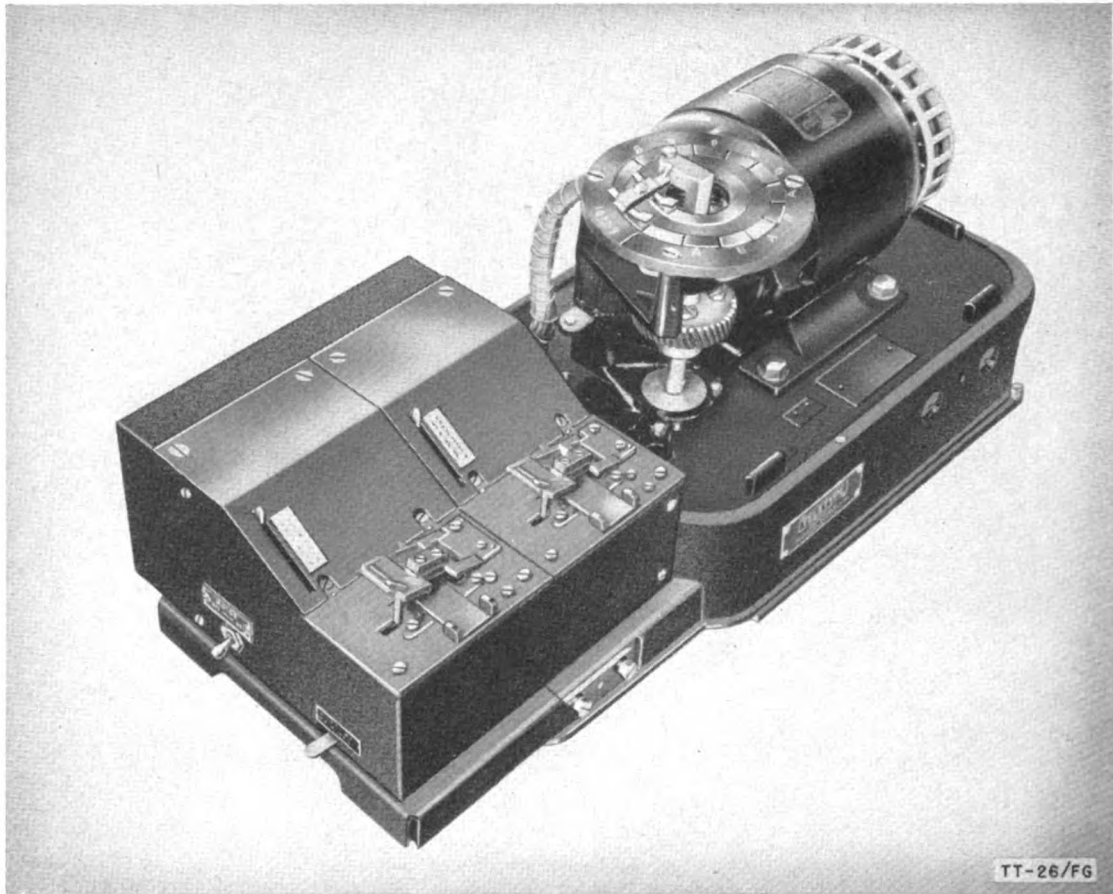


Figure 226. Transmitter-Distributor TT-26/FG.

Status: Limited/Std. *Stock No.:* 4TXD91GL.
Reference: TM 11-2222.

Transmitter-Distributor TT-26/FG is a 2-channel, start-stop, motor-driven unit that utilizes a circuit in such a manner as to provide 2-channel transmission of teletypewriter messages from two separate tapes. When conditions do not warrant 2-channel transmission, the unit may be operated as a single-channel transmitter-distributor. The TT-26/FG includes two tape sensing and transmitting mechanisms and a special distributor commutator which has five pairs of segments for the transmission of intelligence impulses, a start segment, a stop segment, and an X segment located between the start and stop segments. No distributor clutch is provided and the distributor brushes rotate continuously with the motor. The present arrangement requires fully attended service by an operator.

Transmitter-Distributor TT-26/FG is used to get the greatest number of communication channels from existing facilities and in this way increase the

traffic-handling capacity of a given teletypewriter system. The TT-26/FG is used with Teletypewriter TT-10/FG in fixed-plant wire or radio teletypewriter systems of permanent or semi-permanent installations in the communications zone of a theater of operations or in the zone of the interior.

TECHNICAL CHARACTERISTICS

LINE OPERATION: Neutral type telegraph, on a 20- or 60-ma circuit; polar type telegraph, on a 10- or 30-ma circuit.

POWER SUPPLY REQUIRED: 115 v, 60 cyc ac.

SPEED OF OPERATION: 60 speed (368 opm).

FREQUENCY: 23 cps for single-channel operation 46 cps for double-channel operation.

TAPE: Chadless or fully perforated.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	35	70
Total volume (cu ft).....	1.5	5
Ship tons.....		.1



Figure 227. Truck V-17/MTQ.

Status: Standard. *Reference:* TM 11-2262.

Truck V-17/MTQ is a 2½-ton, 6 x 6 vehicle which is equipped with a winch, pole derrick, overhead platform, and power take-off. The larger body provides for a wider serviceability for military operations. The TV-17/MTQ will generally replace Truck K-43 in providing mobile facilities for telephone line construction and maintenance.

Truck V-17/MTQ is used by Signal Corps troops for setting poles and the general construction and maintenance of telephone pole lines.

GENERAL DATA

CREW: 2.
REAR AXLES:
 Gear ratio: 6.66 to 1.
AXLE LOAD; LOADED (lb):
 Front: 4,850.
 Rear: 5,650 on ea.
TIRES: Ply 10, size 7.50 by 20, pressure 55 lb.
GROUND CLEARANCE: 10 in.
ELECTRICAL SYSTEM: 1 ea storage battery, 6 v.

CAPACITIES:

Fuel, 72 octane gasoline: 40 gal.
 Cooling system: 19 qt.
 Crankcase (refill): 7.5 qt.
Transmission:
 Main: 6.5 qt.
 Differential: Front 3 qt; bogie front 3 qt; rear 2.5 qt.
 Transfer case: 3 qt.

BRAKES:

Type: Hydraulic-hydrovac.
 Dimensions: Front 2½ in., rear 3 in.

TRANSMISSION SPEEDS: 5.

PERFORMANCE:

Max computed gradability: 81 percent.
 Turning radius: 35 ft.
 Fording depth: 30 in.
 Allowable speed: 45 mph.
 Fuel consumption (loaded): 7.5 mpg.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	11,050	12,526
Total volume (cu ft).....	1,300	1,500
Ship tons.....		37



Figure 228. Truck V-18/MTQ, rear view.

Status: Standard. Reference: TM 11-2262.

Truck V-18/MTQ is a 2½-ton, 6 x 6 vehicle equipped with a special body which includes an earth boring machine. The V-18/MTQ is intended to replace Truck K-44. For greater mobility, the V-18/MTQ has been equipped with a high flotation tire kit and front-mounted winch. The principal difference in the operation of the service equipment is in the operation of the power take-off for body winch and earth boring machines. The V-18/MTQ has a full torque power take-off that is furnished by a service equipment transfer case.

The V-18/MTQ is used by Signal Corps troops for boring pole holes when constructing and maintaining telephone pole lines.

GENERAL DATA

CREW: 2.
 REAR AXLES:
 Gear ratio: 6.66 to 1.
 AXLE LOAD; LOADED (lb):
 Front: 4,850.
 Rear: 5,650 on ea.
 TIRES: Ply 10, size 7.50 by 20, pressure 55 lb.
 GROUND CLEARANCE: 10 in.

ELECTRICAL SYSTEM: 1 ea storage battery, 6 v.
 CAPACITIES:

Fuel, 72 octane gasoline: 40 gal.

Cooling system: 19 qt.

Crankcase (refill): 7.5 qt.

Transmission:

 Main: 6.5 qt.

 Differential: Front 3 qt; bogie front 3 qt; rear 2.5 qt.

 Transfer case: 3 qt.

BRAKES:

Type: Hydraulic-hydrovac.

Dimensions: Front 2½ in.; rear 3 in.

TRANSMISSION SPEEDS: 5.

PERFORMANCE:

Max computed gradability: 81 percent.

Turning radius: 35 ft.

Fording depth: 30 in.

Allowable speed: 45 mph.

Fuel consumption (loaded): 7.5 mpg.

ADDITIONAL DATA:

Auger engine: Continental, model PF-226.

Hole sizes: 9, 12, 16, or 20 in. in diam, max 7½ ft.

WEIGHT AND VOLUME

	Unpacked	Export pack
Total weight (lb).....	11,050	12,526
Total volume (cu ft).....	1,300	1,500
Ship tons.....		37

CHAPTER 2

TABULATED DATA ON WIRE, CABLES, AND CABLE TERMINALS

Table I. Bare Wire and Messenger Cable

	W-74	W-90 ¹	W-115 ¹	W-116 ¹	W-145	W-153
Sig C stock No.....	1A74.....	1A90.....	1A115.....	1A116.....	1A145.....	1A153.....
Status.....	Limited/Std.....	Standard.....	Standard.....	Standard.....	Standard.....	Standard.....
Diam (in.).....	.104.....	.375.....	.3125.....	.4375.....	.109.....	.080.....
Breaking load (lb).....	550.....	11,500.....	6,000.....	18,000.....	790.....	770.....
Net wt (lb/mi).....	173.....	1,425.....	1,190.....	2,060.....	170.....	94.....
D-c resistance (ohms/loop mi).....	10.3.....				75.....	42.8.....
1,000-cps impedance (ohms).....	614-j145.....				1230-j630.....	791-j481.....
Length/package (ft).....	5,650.....	1,000.....	1,000.....	1,000.....	2,640.....	5,650.....

	WS-9/U	WS-10/U	WS-11/U ²
Sig C stock No.....	1A806.2.....	1A808.1.....	1A809.104.....
Status.....	Standard.....	Limited/Std.....	Standard.....
Diam (in.).....	.162.....	.128.....	.104.....
Breaking load (lb).....	2,433.....	1,800.....	1,170.....
Net wt (lb/mi).....		240.....	159.....
D-c resistance (ohms/loop mi).....		22.3.....	23.5.....
1,000-cps impedance (ohms).....		649-j291.....	686-j335.....
Length/package (ft).....		4,400.....	6,650.....

¹ Messenger cable.
² 104C-S, 40% conductivity.

Table II. Field Wire

	W-50	W-110-B	W-130-(*)	W-143	W-1/TT	WD-3/TT	WD-14/TT
Sig C stock No.....	1B50.....	1B110B.1.....	1B130.....	1B143.....	1B190-1.2.....	1B190-3.....	1B190-14.....
Status.....	Limited/Std.....	Standard.....	Limited/Std.....	Limited/Std.....	Standard.....	Limited/Std.....	Substitute/ Std.
Type.....	Twst-pr.....	Twst-pr.....	Twst-pr.....	Parl-pr.....	Twst-pr.....	Twst-pr.....	Twst-pr.....
Insulation.....	Rubber.....	Buna-S.....	Rubber, polythene, or viny- lite.	Buna-S.....	Polythene, nylon.	Rubber.....	Polythene, nylon.
Cross-section (in.).....	.460.....	.290.....	.120.....	.304.....	.170.....	.180.....	.170.....
Breaking load (lb).....	400.....	300.....	110.....	270.....	200.....	120.....	200.....
Net wt (lb/mi).....	320.....	130.....	34.5.....	240.....	48.....	45.....	48.....
Loading.....	Nonloaded.....	Nonloaded 5280-88.....	Nonloaded.....	Nonloaded 3300-88.....	Nonloaded 5280-88.....	Nonloaded.....	Nonloaded 5280-88.....
D-c resistance (ohms/mi).....	26.....	186.....	590.....	35, 48.....	200.....	590.....	200.....
Capacitance (uf/mi).....	.24, wet.....	.18, wet.....	.19, .28, wet.....	.21.....	.13.....	.19, wet.....	.13.....
1,000-cps impedance (ohms).....	112-j81, wet.....	300-j270, wet.....	505-j475, wet.....	130-j105.....	360-j335, wet.....	505-j475, wet.....	360-j335, wet.....
Length/package.....	1,000 ft/coil.....	1 mi/reel.....	2 mi/reel.....	3/4 mi/reel.....	1 mi/reel.....	1 mi/reel.....	1 mi/reel.....

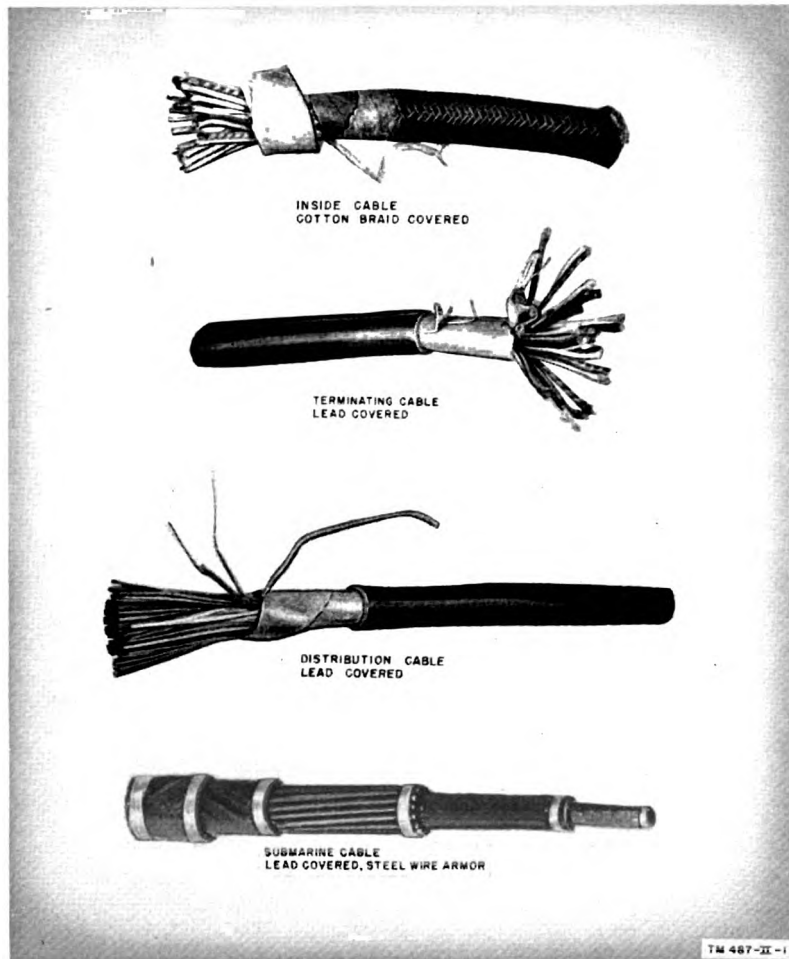


Figure 229. Cables.

Table III. Telephone Cable, Lead-Covered, Armored

	WC-251	WC-321	WC-325	WC-327	WC-329	WC-335
Sig C stock No.....	1D251	1D321	1D325	1D327	1D329	1D335.
Status.....	Standard	Standard	Standard	Standard	Standard	Standard.
Armor.....	Double tape	Single wire	Single wire	Single wire	Single wire	Double wire.
Insulation.....	Paper	Paper	Paper	Paper	Paper	Double paper.
No. of pr.....	1	10	25	50	100	25.
Conductor size.....	#19 AWG	#19 AWG	#19 AWG	#19 AWG	#19 AWG	#19 AWG.
Diam (in.).....	.375	1.75	1.875	2.813		2.75.
D-c resistance (ohms/loop mi/pr).....	86	86	86	86	86	86.
Capacitance.....	.084	.084	.084	.084	.084	.084.
1,000-cps impedance (ohms/pr).....	295-j273	295-j273	295-j273	295-j273	295-j273	295-j273.
Length/reel (ft).....		3,000	2,000	2,000	1,500	2,000.

Table III. Telephone Cable, Lead-Covered, Armored—Continued

	WC-337	WC-339	WC-355	WC-357	WC-364	WC-366
Sig C stock No.	1D337	1D339	1D355	1D357	1D364	1D366.
Status	Standard	Standard	Standard	Standard	Standard	Standard.
Armor	Double wire.	Double wire.	Double tape.	Double tape.	Double tape.	Double tape.
Insulation	Paper	Paper	Paper	Paper	Paper	Paper.
No. of pr	75	100	50	100	10	25.
Conductor size	#19 AWG	#19 AWG	#22 AWG	#22 AWG	#22 AWG	#22 AWG.
Diam (in.)	3.09	3.52	.80	1.05	.45	.63.
D-c resistance (ohms/loop mi/pr)	86	86	171	171	171	171.
Capacitance (uf/mi/pr)	.084	.084	.082	.082	.082	.082.
1,000-cps impedance (ohms/pr)	295-j273	295-j273	416-j399	416-j399	416-j399	416-j399.
Length/reel (ft)	1,500	1,000	2,000	3,000	3,000	2,000.

	WC-367	WC-368	WC-369	WC 370	WC-371
Sig C stock No.	1D367	1D368	1D369	1D370	1D371.
Status	Standard	Standard	Standard	Standard	Standard.
Armor	Double tape	Double tape	Double tape	Double tape	Double tape.
Insulation	Paper	Paper	Paper	Paper	Paper.
No. of pr	50	100	10	16	25.
Conductor size	#19 AWG	#19 AWG	#22 AWG	#22 AWG	#22 AWG.
Diam (in.)	1.05	1.35	.48	.53	.60.
D-c resistance (ohms/loop mi/pr)	86	86	171	171	171.
Capacitance (uf/mi/pr)	.084	.084	.082	.082	.082.
1,000-cps impedance (ohms/pr)	295-j273	295-j273	416-j399	416-j399	416-j399.
Length/reel (ft)	2,000	1,000	4,500	4,000	3,000.

	WC-373	WC-374	WC-375	WC-376	WC-378
Sig C stock No.	1D373	1D374	1D375	1D376	1D378.
Status	Standard	Standard	Standard	Standard	Standard.
Armor	Double tape	Double tape	Double tape	Double tape	Double tape.
Insulation	Paper	Paper	Paper	Paper	Paper.
No. of pr	150	150	200	200	300.
Conductor size	#19 AWG	#22 AWG	#19 AWG	#22 AWG	#22 AWG.
Diam (in.)	1.62	1.22	1.84	1.40	1.67.
D-c resistance (ohms/loop mi/pr)	86	171	86	171	171.
Capacitance (uf/mi/pr)	.084	.082	.084	.082	.082.
1,000-cps impedance (ohms/pr)	295-j273	416-j399	295-j273	416-j399	416-j399.
Length/reel (ft)	1,500	1,600	1,400	1,600	1,400.

Table IV. Telephone Cable, Lead-Covered, Nonarmored

	WC-401	WC-404	WC-407	WC-409	WC-411	WC-412
Sig C stock No.	1C401	1C404	1C407	1C409	1C411	1C412.
Status	Standard	Standard	Standard	Standard	Standard	Limited/Std.
Insulation	Paper	Paper	Paper	Paper	Paper	Paper.
No. of pr	10	25	50	100	10	15.
Conductor size	#19 AWG	#19 AWG	#19 AWG	#19 AWG	#22 AWG	#22 AWG.
Diam (in.)	.64	.88	1.18	1.59	.46	.50.
D-c resistance (ohms/loop mi/pr)	86	83	86	86	171	171.
Capacitance (uf/mi/pr)	.084	.084	.084	.084	.082	.082.
1,000-cps impedance (ohms/pr)	295-j273	295-j273	295-j273	295-j273	416-j399	416-j399.
Length/reel (ft)	3,000	3,000	2,500	1,600	3,500	3,500.

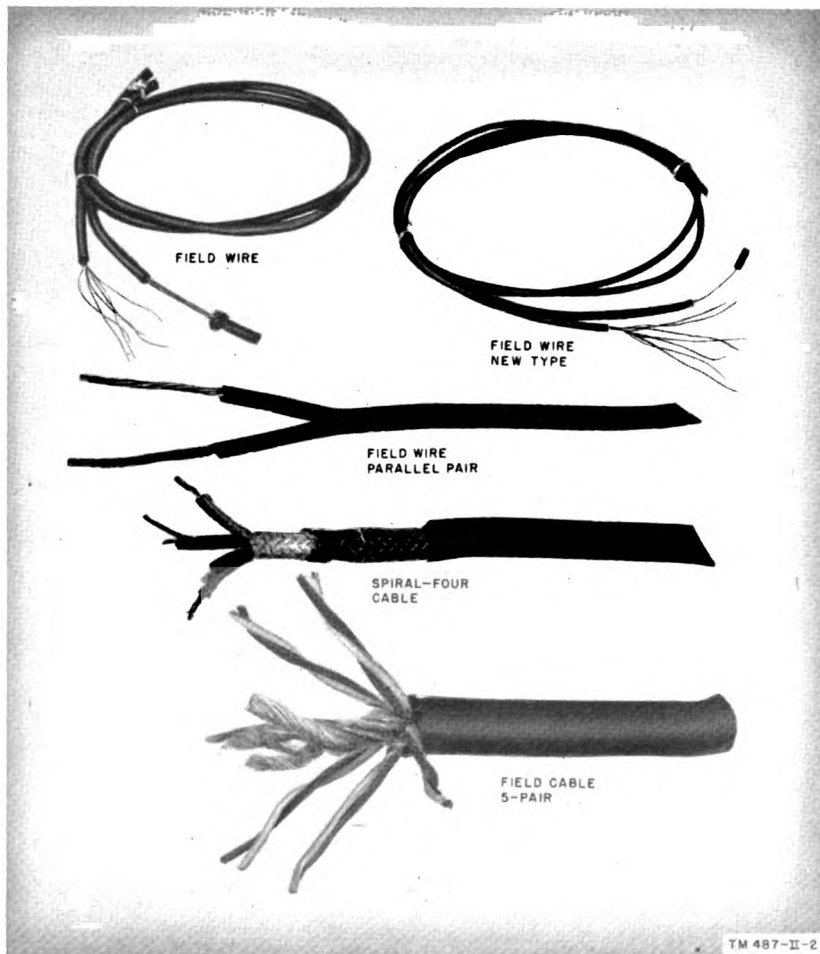


Figure 230. Field wire and cables.

Table IV. Telephone Cable, Lead-Covered, Nonarmored—Continued

	WC-414	WC-417	WC-419	WC-421	WC-423	WC-429
Sig C stock No.	1C414.....	1C417.....	1C419.....	1C421.....	1C423.....	1C429.....
Status.....	Standard...	Standard...	Standard...	Standard...	Standard...	Standard...
Insulation.....	Paper.....	Paper.....	Paper.....	Paper.....	Paper.....	Paper.....
No. of pr.....	25.....	50.....	100.....	200.....	300.....	600.....
Conductor size.....	#22 AWG...	#22 AWG...	#22 AWG...	#22 AWG...	#22 AWG...	#22 AWG...
Diam (in.).....	.62.....	.77.....	1.04.....	1.40.....	1.62.....	2.25.....
D-c resistance (ohms/loop mi/pr).....	171.....	171.....	171.....	171.....	171.....	171.....
Capacitance (uf/mi/pr).....	.082.....	.082.....	.082.....	.082.....	.082.....	.082.....
1,000-cps impedance (ohms/pr).....	416-j399...	416-j399...	416-j399...	416-j399...	416-j399...	416-j399...
Length/reel (ft).....	4,200.....	3,000.....	3,000.....	1,600.....	1,400.....	900.....

Table IV. Telephone Cable, Lead-Covered, Nonarmored—Continued

	WC-447	WC-449	WC-450	WC-452	WC-453	WM-13/U
Sig C stock No.	1C447	1C449	1C450	1C452	1C453	1C461.1
Status	Standard	Standard	Standard	Standard	Standard	Standard
Insulation	Paper	Paper	Paper	Paper	Paper	Paper
No. of pr	10	25	50	200	300	100
Conductor size	#24 AWG	#24 AWG	#24 AWG	#19 AWG	#19 AWG	#24 AWG
Diam (in.)	.4375	.5625	.6875	2.18	2.60	.78
D-c resistance (ohms/loop mi/pr)	274	274	274	86	86	274
Capacitance (uf/mi/pr)	.072	.072	.072	.084	.084	.072
1,000-cps impedance (ohms/pr)	558-j542	588-j542	588-j542	295-j273	295-j273	558-j542
Length/reel (ft)	3,000	3,000	2,500	1,200		

	WM-14/U	WM-34/U
Sig C stock No.	1C463.1	1C468.1
Status	Standard	Standard
Insulation	Paper	Paper
No. of pr	200	1,200
Conductor size	#24 AWG	#24 AWG
Diam (in.)		2.35
D-c resistance (ohms/loop mi/pr)	274	274
Capacitance (uf/mi/pr)	.072	.072
1,000-cps impedance (ohms/pr)	558-j542	558-j542
Length/reel (ft)		

Table V. Switchboard Cable, Cotton Braid Over Lead and Paper Tape

	WC-503	WC-504	WC-505	WC-506	WC-532
Sig C stock No.	1E503	1E504	1E505	1E506	1E532
Status	Standard	Standard	Standard	Standard	Standard
No. of pr	10	20	40	20	50
No. of single conductors	1	1	1	20	1
Conductor size	#22 AWG	#22 AWG	#22 AWG	#22 AWG	#22 AWG
Cable shape	Oval	Oval	Oval	Oval	Round
Major diam (in.)	.50	.55	.78		.75

Table VI. Terminating Cable, Lead-Covered

	WM-18/U	WM-19/U	WM-20/U	WM-21/U	WM-22/U	WM-23/U	WM-24/U
Sig C stock No.	1C822. 10-2	1C822. 25-1	1C822. 50	1C819. 26	1C822. 100-2.1	1E3019-104	1C822. 200-3.
Status	Standard	Standard	Standard	Limited/Std.	Standard	Limited/Std.	Standard
Insulation	Textile	Textile	Textile	Textile	Textile	Textile	Textile
No. of conductors	10 pr	25 pr	51 pr	27 quads	100 pr	52 quads	200 pr
Conductor size	#22 AWG	#22 AWG	#22 AWG	#19 AWG	#22 AWG	#19 AWG	#22 AWG

Table VII. Quadded Telephone Cable, Lead-Covered

	WC-372	WM-10/U	WM-11/U	WM-15/U	WM-16/U	WM-17/U
Sig C stock No.....	1D367.1.....	1C819.26-1..	1C819.51-1..	1C819.204...	1C819.304...	1C819.12.
Status.....	Limited/Std..	Limited/Std..	Limited/Std..	Limited/Std..	Limited/Std..	Limited/Std.
Armor.....	Double tape..	Unarmored..	Unarmored..	Unarmored..	Unarmored..	Unarmored.
Insulation.....	Paper.....	Paper.....	Paper.....	Paper.....	Paper.....	Paper.
No. of quads.....	26.....	27.....	51.....	102.....	76.....	13.
Conductor size.....	#19 AWG.....	#19 AWG.....	#19 AWG.....	#19 AWG.....	#19 AWG.....	#19 AWG.
Length/reel (ft).....	2,500.....	3,000.....	1,500.....	.....	.....	3,000.

	WM-25/U	WM-26/U	WM-29/U	WM-38/U
Sig C stock No.....	1D329.1.....	1D400.204...	1D366.1.....	1D368.8.
Status.....	Limited/Std..	Limited/Std..	Limited/Std..	.....
Armor.....	Single tape..	Single tape..	Single tape..	Double tape.
Insulation.....	Paper.....	Paper.....	Paper.....	Paper.
No. of quads.....	50.....	102.....	12.....	50.
Conductor size.....	#19 AWG.....	#19 AWG.....	#19 AWG.....	#19 AWG.
Length/reel (ft).....	1,500.....	1,500.....	3,000.....	1,500.

Table VIII. Cable Terminals

	TA-59/FT	TA-60/FT
Sig C stock No.....	5C2502.....	5C2562.....
Status.....	Standard.....	Standard.
WECO No.....	BD102.....	BD202.
Application.....	Outside.....	Outside.
Capacity.....	102 pr.....	202 pr.
Protection.....	Unprotected..	Unprotected.
Purpose.....	Cable termination, cross connecting pt equipped w/12-ft cable stub.	Cable termination, cross connecting pt equipped w/10-ft cable stub.
Case material.....	Metal.....	Metal.

	TA-61/FT	TA-62/FT	TA-63/FT	TA-64/FT	TA-65/FT
Sig C stock No.....	5C2584.....	5C2426.2.....	4E9022X/51....	4E7951.3.....	4E7926.2.
Status.....	Standard.....	Standard.....	Standard.....	Standard.....	Standard.
WECO No.....	BD304.....	.....	EA-51.....	B51.....	.....
Application.....	Outside.....	Outside.....	Outside.....	Outside.....	Outside.
Capacity.....	304 pr.....	26 pr.....	51 pr.....	51 pr.....	26 pr.
Protection.....	Unprotected..	Carbon blocks and heat coils.	Carbon blocks and heat coils.	Fuses.....	Fuses.
Purpose.....	Cable termina- tion, cross connecting pt equipped w/ 10-ft cable stub.	Cable termina- tion, cross connecting pt between ae- rial and underground cable.	Cable termina- tion, cross connecting pt between ae- rial and underground cable.	Cable termina- tion, cross connecting pt at junction of aerial and underground cable.	Cable termina- tion, cross connecting pt between aerial and under- ground cable.
Case material.....	Metal.....	Wood.....	Wood.....	Wood.....	Wood.

Table VIII Cable Terminals—Continued

	TA-66/FT	TA-67/FT	TA-68/FT	TA-69/FT	TA-70/FT
Sig C stock No.....	5C2501.2.....	4E7911.....	4E7826.....	4E7851.....	4E7916.....
Status.....	Standard.....	Standard.....	Standard.....	Standard.....	Standard.....
WECO No.....	B101.....	LC-11.....	LC-26.....	LC-51.....	LA-16.....
Application.....	Outside.....	Inside.....	Inside.....	Inside.....	Inside.....
Capacity.....	101 pr.....	11 pr.....	26 pr.....	51 pr.....	16 pr.....
Protection.....	Fuses.....	Carbon blocks and fuses.....	Carbon blocks and fuses.....	Carbon blocks and fuses.....	Carbon blocks and fuses.....
Purpose.....	Cable termination, cross connecting pt between aerial and underground cable.....	Moistureproof cable termination equipped w/10-ft cable stub.....	Moistureproof cable termination equipped w/10-ft cable stub.....	Moistureproof cable termination equipped w/10-ft cable stub.....	Moistureproof cable termination equipped w/10-ft cable stub.....
Case material.....	Wood.....	Sheet metal.....	Sheet metal.....	Sheet metal.....	Sheet metal.....

	TA-71/FT	TA-72/FT	TA-92/FT
Sig C stock No.....	4E7926.....	4E7951.....	5C3030.....
Status.....	Standard.....	Standard.....	Standard.....
WECO No.....	LA-26.....	LA-51.....	
Application.....	Inside.....	Inside.....	Subterranean.....
Capacity.....	26 pr.....	51 pr.....	6 pr.....
Protection.....	Carbon blocks and fuses.....	Carbon blocks and fuses.....	Unprotected.....
Purpose.....	Moistureproof cable termination equipped w/10-ft cable stub.....	Moistureproof cable termination equipped w/10-ft cable stub.....	Immersion-proof cable termination.....
Case material.....	Sheet metal.....	Sheet metal.....	Cast brass.....

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