
US ARMY
SOUTHEASTERN SIGNAL SCHOOL
FORT GORDON, GEORGIA

# SPECIAL TEXT 11-154-3

## SIGNAL REFERENCE DATA

# WIRE AND MULTICHANNEL COMMUNICATIONS EQUIPMENT

PREPARED BY
OFFICE OF DEPUTY COMMANDANT FOR
COMBAT TRAINING AND DEVELOPMENT

4-11-C20/
4-11-C22/
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NCOE DIV

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SOUTHEASTERN SIGNAL SCHOOL
FORT GORDON GEORGIA 30905

1 October 1973

Special Text 11-154-3 has been prepared by the US Army Southeastern Signal School. This text is prepared for resident and nonresident instruction conducted at the US Army Southeastern Signal School. It reflects the current thought of this school and conforms to printed Department of the Army doctrine as closely as possible.

Suggestions and criticisms relative to form, content, purpose or use of this text, are invited and should be referred to the Commandant, US Army Southeastern Signal School, ATTN: ATSO-CTD-DT-L, Fort Gordon, Georgia 30905.

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## GENERAL TABLE OF CONTENTS

The table of contents below lists each chapter and appendix in ST 11-154-3. Where required, a detailed table of contents is provided at the beginning of each chapter and appendix, starting on the pages listed below.

## PURPOSE AND SCOPE

ST 11-154-3, Signal Reference Data-Wire and Multichannel (MCHAN) Communications Equipment, is a ready source of factual information about wire and MCHAN communications equipment provided to support instruction conducted by the United States Army Southeastern Signal School.

The text includes technical data on the signal equipment used by TOE organizations and on developmental equipment. Information presented in this text is current as of 1 October 1973. Refer to DA PAM 310-4, Military Publications, Index of Technical Manuals.

## RELATED PUBLICATIONS

ST 11-154-1, Signal Reference Data - Tables of Organization and Equipment.

ST 11-154-2, Reference Data - Radio Communications Equipment.

ST 11-154-4, Communications Systems Planning, Engineering and Control (SYSCON).

## SUPERSESSION NOTICE

ST 11-154-3, Signal Reference Data - Wire and MCHAN Communications Equipment, supersedes ST 11-154-3, Signal Reference Data - Wire and Radio Relay Communications Equipment, dated 1 February 1970.

## NOTES ON THIS TEXT

1. The information about equipment in this text does not distinguish between models, except in cases where technical characteristics are different. In addition, when more than one model of an equipment exists, only one is illustrated. Detailed information covering differences in models, when required, is provided in the technical manual on the equipment.

2. In some cases, the federal stock number and TM reference number are not available for developmental and recently standardized equipment. The spaces for these items were left blank purposely for you to jot them down as they become available.

3. There is an index at the rear of the text. The equipment is indexed alphabetically by nomenclature type number; however, the name in parenthesis is not always the official name (nomenclature).

CHAPTER 1

# TELEPHONE, TELETYPEWRITER, AND FACSIMILE EQUIPMENT

CONTENTS

## TELEPHONE SET TA-1/PT

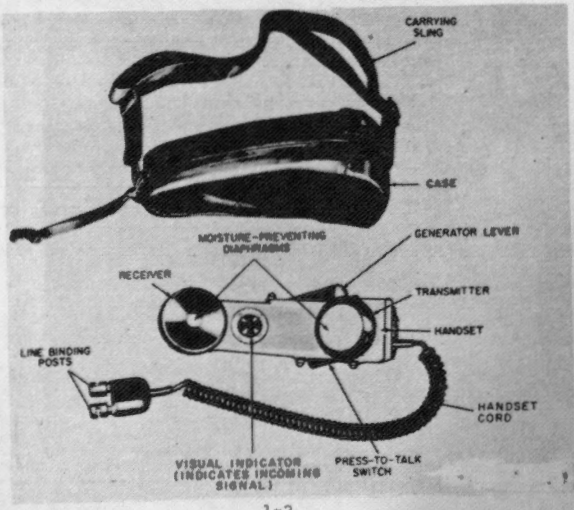
STATUS: STD-A; FSN 5805-521-1320
REF: TM 11-5805-243-12

### GENERAL INFORMATION

The TA-1/PT is a lightweight, weather-proof, sound-powered telephone intended for use on field wire lines in forward areas. It can be used for communications with any local battery field telephone or local battery switchboard.

### TECHNICAL CHARACTERISTICS

Application: Point-to-point and local battery systems.
Power Req Talking - None.
Ringing - Hand ringing gen 90V, 20Hz.
Working Limits: 10db (approx 4 miles of WD-1/TT).
Type Signal: Visual (nonadjustable maltese cross) and Audible (adjustable from loud to off).
Weight: Telephone 2 3/4 lbs.
Carrying Case 7/8 lb.



## TELEPHONE SET TA-312/PT

STATUS: STD A; FSN: 5805-543-0012
REF: TM 11-5805-201-12

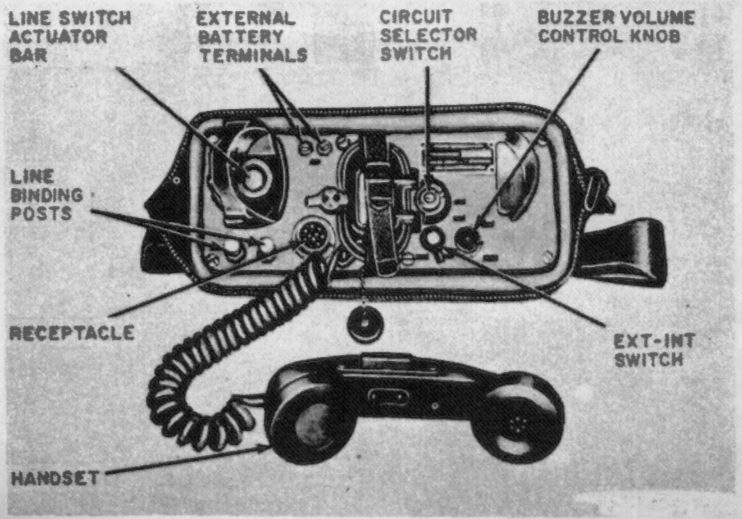
### GENERAL INFORMATION

The TA-312/PT is a two-wire, battery operated field telephone. It may be used in a simple point-to-point voice frequency (VF) wire communications link or in any two-wire ringdown subscriber position of a telephone communications system.

### TECHNICAL CHARACTERISTICS

| | POSITION | FUNCTION |
|---|---|---|
| Types of Operation: | CB | Common Battery Operation |
| | LB | Local Battery Operation |
| | CBS | Common Battery Signaling (local battery for voice) |
| Power Required: | Talking | LB and CBS: 3vdc (2 ea BA-30 or an external source). CB: Supplied by central office. |
| | Ringing | Hand-ringing gen, 90V, 20Hz |

Working Limits: Wet 35 DB (14 mile on WD-1/TT non loaded).
Dry 35 DB (22 mile on WD-1/TT non loaded).
Type Signal: Audible (adjustable loud to low but not off).
Weight: 9.5 lbs.




Telephone Set TA-312/PT.

## TELEPHONE SET TA-264/PT

STATUS: STD-A; FSN: 5805-074-4542
REF: TM 11-2059

### GENERAL INFORMATION

The TA-264/PT is a tactical, field telephone which provides communications over greater distances than can be obtained with ordinary local battery sets. The TA-264/PT uses vacuum tube amplifiers in both the transmitting and receiving circuits, thus it cannot be used with carrier circuits and should not be used in switched systems. The TA-264/PT may be used as a terminal in a point-to-point local battery system, and it may also be used as a standard set (no amplification) in a local battery system.

### TECHNICAL CHARACTERISTICS

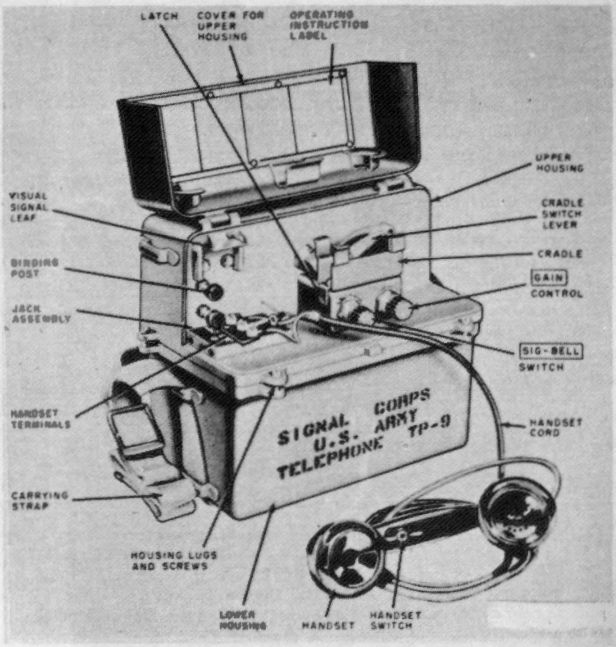
Types of operation: Local battery (LB) with amplification (1-way reversible only). Local battery (LB) without amplification (hook switch down).

Power Requirements: Talking: W/amplification:
1 ea BA-27 (4-1/2v).
1 ea BA-65 (1-1/2v).
3 ea BA-2 (22-1/2v).
W/O amplification:
1 ea BA-27 (4-1/2v).
Ringing: Hand-ringing generator, 90v ac, 20Hz.

Maximum Working Limits: (Assuming 0-dbm input.)

1. Point-to-point circuit: 106 db total line loss will result in a circuit net loss of 36 db. (15 db + 55 db + 36 db = 106 db).
2. Point-to-point circuit: 90 db total line loss will result in a circuit net loss of 20 db.
3. Preferred working range: 35 db to 75 db line loss.

Type signal: Audible (bell) or visual (signal leaf).
Amplification: Xmit: Fixed 15 db gain.
Rec: Variable to 55 db max gain.
Weight: 21-1/2 lbs with batteries.




Note: Telephone Set TA-264/PT is similar in purpose, operation, and appearance to Telephone Set TP-9.

## TELEPHONE SET TA-236/FT

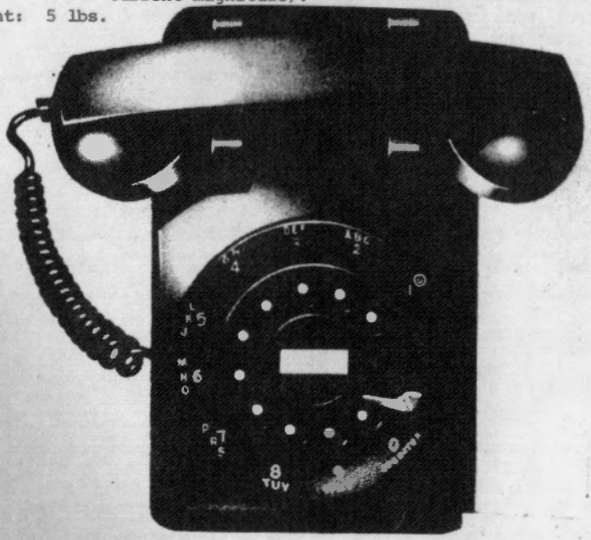
STATUS: STD-A; FSN: 5805-503-2774
REF: TM 11-468

### GENERAL INFORMATION

The TA-236/FT is a general purpose desk telephone, which includes an antiside tone feature.

### TECHNICAL CHARACTERISTICS

Type of operation: Common Battery (CB) (manual or dial).
Power requirements: Talking and signaling power supplied by central office.
Working limits: 36 db.
Type of signal: Audible (adjustable loud to low but not off) (to off when modified).
Ringer: Two-party selective.
Transmission: Automatic transmission equalizer (controlled by dc line current magnitude).
Weight: 5 lbs.



## Section II. TELEPHONE SWITCHBOARDS

### SWITCHBOARD, TELEPHONE, MANUAL SB-993/GT

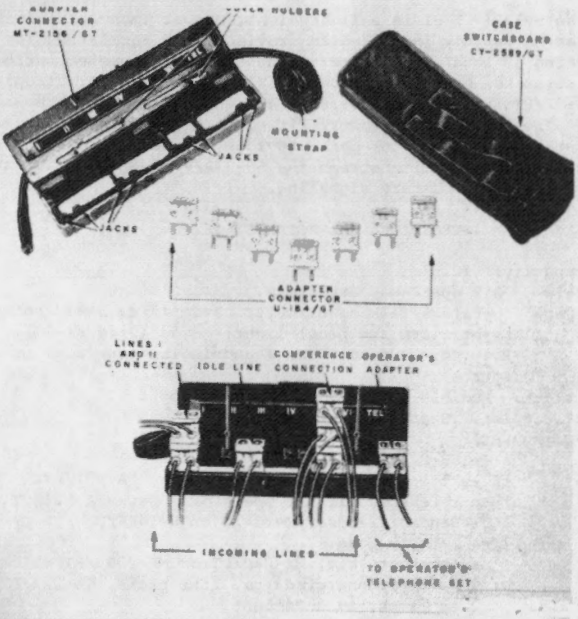
STATUS: STD-A; FSN: 5805-708-2202
REF: TM 11-5805-294-15

#### GENERAL INFORMATION

The SB-993/GT is a light, portable, emergency switchboard capable of handling six local battery telephone lines and is used in forward areas. It requires the use of a local battery or a sound-powered telephone set (not a component) for the operator.

#### TECHNICAL CHARACTERISTICS

Line capacity: 6.
Power requirements: None.
Protection: None.
Night alarm: None.
Adapter connectors: 7 each.
Cord Circuits: None (circuit routing by switching connectors).
Type of line signal: Neon glow lamp.
Weight: 2-1/2 lbs.




**Switchboard, Telephone, Manual SB-993/GT.**

## SWITCHBOARD, TELEPHONE, MANUAL SB-22/PT AND SB-22A/PT

STATUS: STD-A; FSN: 5805-257-3602 (SB-22/PT)
5805-715-6171 (SB-22A/PT)
REF: TM 11-5805-262-12,-35

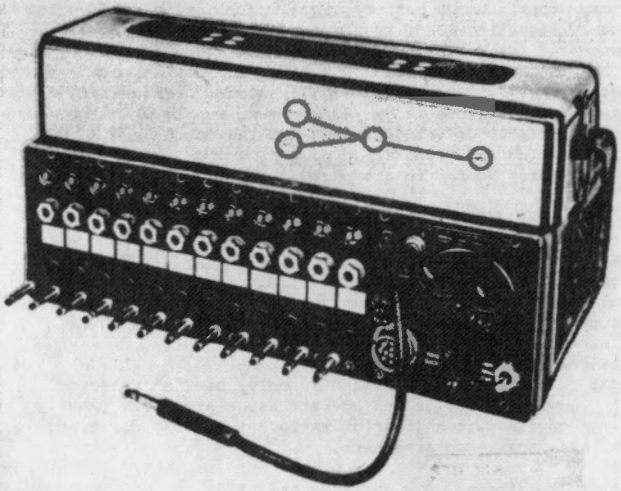
### GENERAL INFORMATION

The SB-22( )/PT is a lightweight, manual (monocord) switchboard that can be rapidly installed to provide field facilities for interconnecting 12 local battery telephone circuits, remote controlled radio circuits, or voice-frequency (VF) teletypewriter circuits. The SB-22/PT includes an accessory kit which contains three line packs. The SB-22A/PT accessory kit contains two line packs and one trunk pack. The trunk pack provides one-way ringdown - one-way automatic trunk circuit between the SB-22A/PT and any other switchboard with common battery signaling.

### TECHNICAL CHARACTERISTICS

Line capacity: 12.
Protection: Air spark-gap arresters.
Power Req: Operators talking circuit: 3vdc (2 ea BA-30 batteries).
Night alarm and panel light: 3vdc (2 ea BA-30).
Ringing: 90v ac, 20Hz (handringing generator or external source).
Night alarm: Audible (buzzer) or visual (lamp).
Weight: 30 lbs. (approx).
Major Components:
1 ea SB-22/PT.
12 ea telephone circuits, linepack, TA-222/PT.
1 ea telephone circuit operator's pack TA-221/PT.
1 ea Handset-Headset H-144/U or H-144A/U.
1 ea battery case.
1 ea accessory kit, MX-230/PT or MX-230A/PT which contains:
3 ea telephone circuits, line packs, TA-222/PT.
2 ea lamps, incandescent.

SB-22A/PT:
12 ea telephone circuits, line packs, TA-222/PT.
1 ea telephone circuit operator's pack, TA-221/PT.
1 ea Handset-Headset, H-144/U or H-144A/U.
1 ea battery case.
1 ea accessory kit, MX-2915/PT which contains:
1 ea telephone circuit, trunk pack, TA-326/PT.
2 ea telephone circuits, line packs TA-222/PT.
2 ea lamps, incandescent.



Switchboard, Telephone, Manual SB-22/PT.

SWITCHBOARD, TELEPHONE, MANUAL SB-86/P

STATUS: STD-A; FSN: 5805-503-2660
REF: TM 11-2134, TM 11-4134

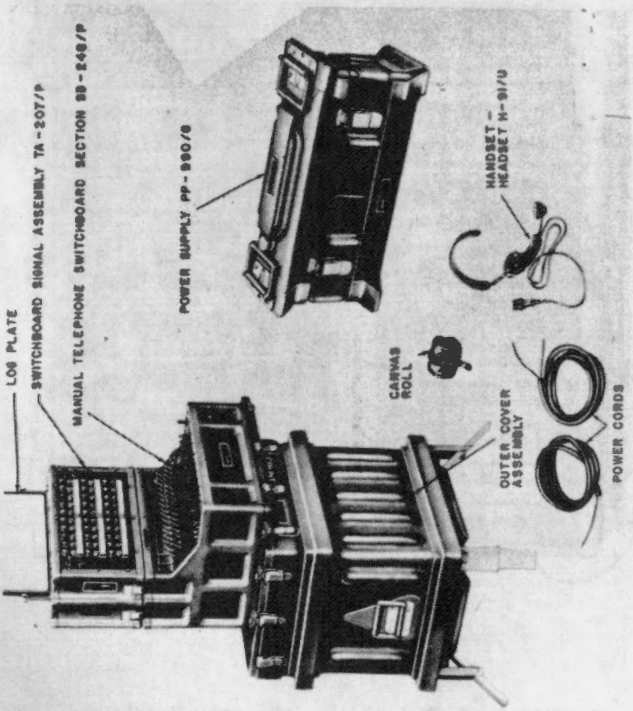
GENERAL INFORMATION

The SB-86/P is a tactical, single-position, 30-circuit, local battery switchboard. The SB-86/P provides facilities for terminating local battery loops, common battery signaling loops, ring-down trunks, common battery signaling (CBS) trunks, and two one-way ring-down - one-way automatic trunks to any switchboard with common battery signaling. The basic issue may be expanded to terminate 60 circuits by adding another TA-207, Switchboard Signal Assembly (Jack Field Section). Included in the basic issue is PP-990/G, Power Supply which provides key ringing power (30v dc vibrator) and housing for 5 each BA-200. Also, drop operation and restoration power (24 v dc is provided by 5 BA-200 (one spare) housed in the pack.

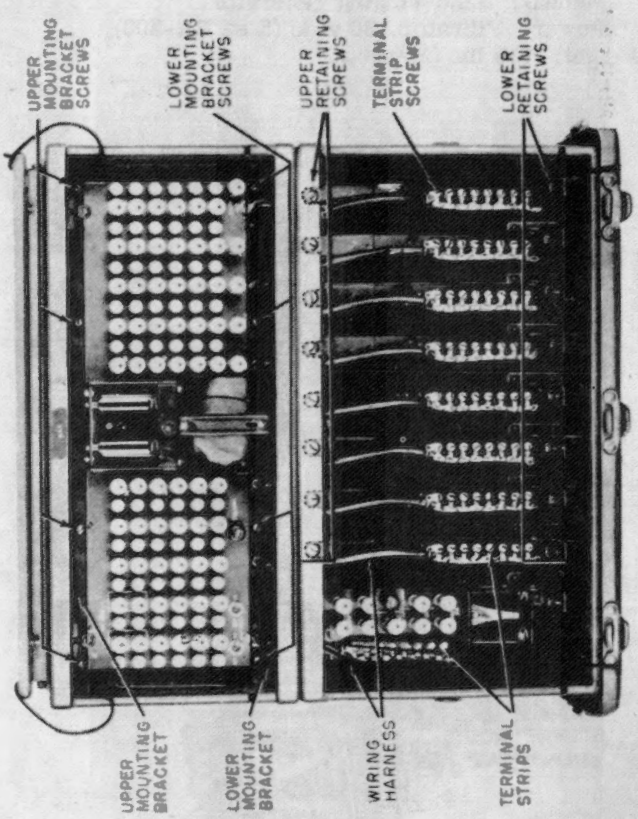
TECHNICAL CHARACTERISTICS

Cord circuits: 16.
Circuit capacity: 30 loops or trunks.
Circuit selector switch positions:
M: (Magneto) local battery line or trunk termination 20 Hz.
C: CB signaling, local line, 24 v dc.
T: CB signaling, trunk.
CIV TRKS: On line circuits 29 and 30 only, use "M" selector switch position and operate associated "CIV TRKS" toggle switch (rear of TA-207/P) to "ON" position.
Protection: Air spark-gap arresters.
Power req:
Operator talk battery: 3 v dc (2 ea BA-30).
Drop operation: C or T: 24 v dc.
M: 90 v, 20 Hz.
Drop restoration: 24 v dc.

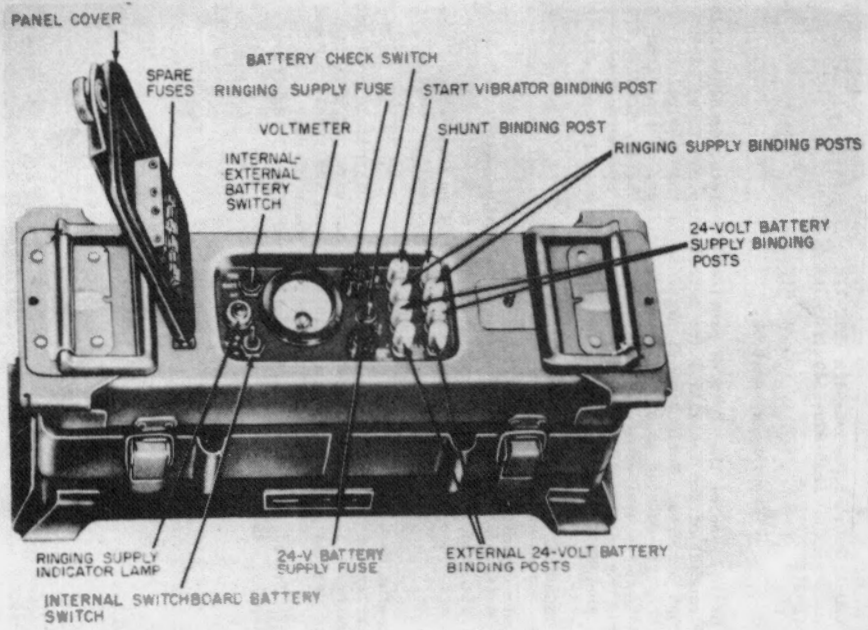
Night alarm: Audible (buzzer) or visual (lamp) (2 ea BA-30).
Ringing: 90 v ac, 20 Hz.
Manual: Hand-ringing generator.
Power: Vibrator, 30 v dc (5 ea BA-200)
Weight: 180 lbs (approx).




Switchboard, Telephone, Manual SB-86/P.




**Switchboard, Telephone, Manual SB-86/P (rear).**




Power Supply PP-990/G.

## CENTRAL OFFICE, TELEPHONE, MANUAL AN/TTC-7

STATUS: STD-A; FSN: 5805-395-9422 (TTC-7)
5805-820-9549 (TTC-7A)
REF: TM 11-2146

### GENERAL INFORMATION

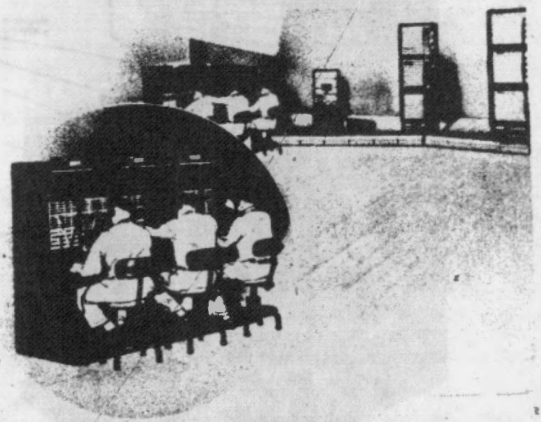
The basic issue of the AN/TTC-7 provides complete, transportable, telephone central office facilities for terminating 200 local lines and 40 trunk circuits. Various configurations of this equipment may be either van-mounted as a mobile central office, or installed in a building as a semipermanent central office. The AN/TTC-7 basic issue may be expanded to handle 1, 160 lines by adding components. The AN/TTC-7 is used at higher echelons of the field army.

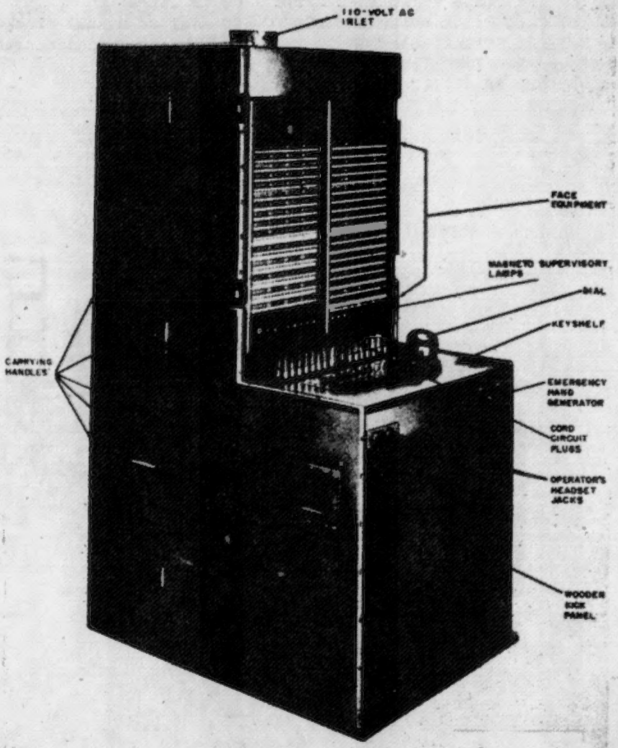
### TECHNICAL CHARACTERISTICS (BASIC ISSUE)

Line circuit capacity: CB: 100. CB or LB: 100 (selector switches on relay racks).
Trunk circuit capacity: Manual or dial: 20. Plug supervision: 20 (1 ea Converter, Tel Signal TA-187/U required for each four trunks).
Type of operation: Manual.
Multiple arrangement: Bridged multiple (lamp associated) 2- or 4-panel.
Cord circuits: 15 universal paired-cord type circuits per position.
Protection devices: Spark-gap arresters for lines and trunks. Fuses and circuit breakers for power circuit.
Power req: 110/220 v ac, 60 Hz; 48 v dc; and 90 v ac, 20 Hz (ring).
Ringing supply: 48 v dc and 90 v ac, 20 Hz.

Major components, basic issue:

3 ea Swbd, Tel, Manual SB-249/TTC (max 580 lines ea)
3 ea Main Distributing Fram TA-257/TTC (100 lines ea)
1 ea Tel Ckt, Line Relay TA-223/TTC (100 LB-CB lines)
1 ea Tel Ckt, Line Relay TA-224/TTC (100 CB lines)
1 ea Tel Ckt, Trunk Relay TA-226/TTC (20 dial or manual trunks)
1 ea Tel Ckt, Trunk Relay TA-276/TTC (20 plug supervision trunks)
1 ea Power Panel BD-132-A (rectifier and ringers)
4 ea Battery BB-46 (12 v dc ea).






**SB-249/TTC, Switchboard, Telephone, Manual (part of AN/TTC-7).**

SWITCHBOARD, TELEPHONE CORDLESS
SB-3082(U)1/GT AND SB-3082(U)2/GT

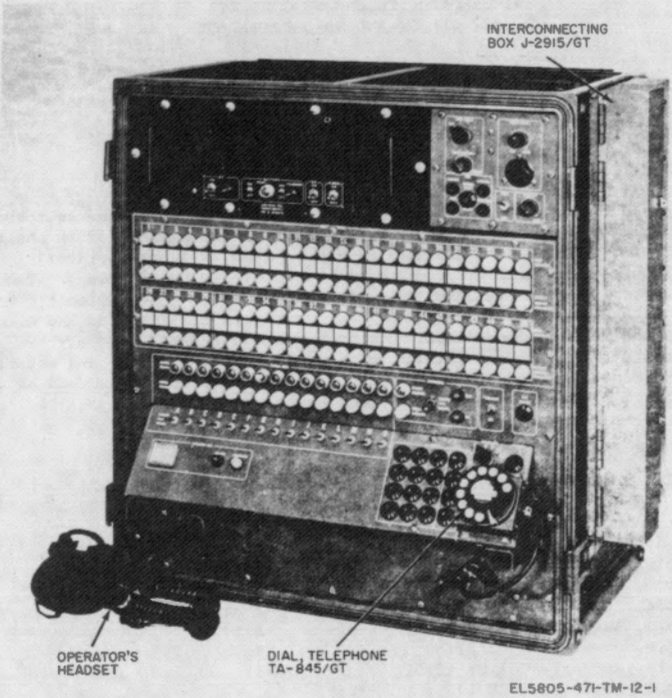
STATUS: STD-B; FSN: 5805-235-5035 (SB-3082(U)1/GT)
5805-235-5034 (SB-3082(U)2/GT)
REF: TM 11-5805-471-12

GENERAL INFORMATION

The switchboard is a 2-wire, 50-termination telephone switchboard capable of being mounted in a 1/4 ton cargo truck M151, or in shelter S-250/G, S-280/G or S-318/G. It may be used as a one operator switchboard or with another switchboard for 100-terminations. The equipment may be operated in a manual mode or in a semiautomatic mode. In a two switchboard operation, two operators are required and either can control its operation. The operator can interconnect any two terminations, perform preempt of any termination in use, and establish conference for up to six subscribers. The switchboard is used as part of a telephone communications system.

Items Comprising an Operable Equipment.

| ITEM | SB-3082 (U)1/GT | SB-3082 (U)2/GT |
|---|---|---|
| Swbd, Tel, Cordless SB-3082/GT | 1 | 1 |
| Cable, Power Elec CX 12246 | 1 | |
| Cable, Power Elec CX 12247 | 1 | 1 |
| Cable, Power Elec CX 12248 | 2 | 2 |
| Cable, Assembly Tel CX 12249 | 3 | 2 |
| Cable, Power Elec CX 12250 | 1 | 1 |
| Cable, Assembly Tel CX 12251 | 3 | |
| Cable, Power Elec CX 12252 | | 1 |
| Dial, Telephone TA-845/GT | 1 | 1 |




*Switchboard, Telephone, Cordless, Manual SB-3082(V)1/GT or SB-3082(V)2/GT.*

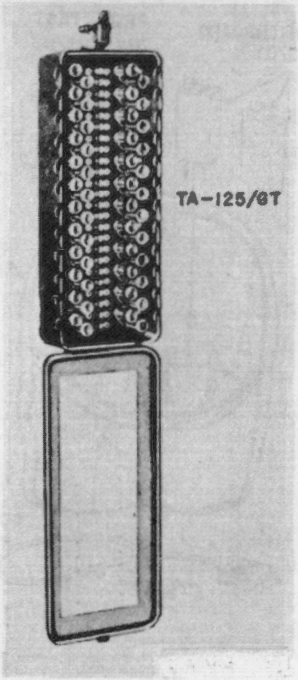
## Section III. AUXILIARY TELEPHONE EQUIPMENT

### TERMINAL BOX TA-125/GT

STATUS: STD-B; FSN: 5805-538-0777
REF: TM 11-2138

### GENERAL INFORMATION

The TA-125/GT is a small, lightweight, weatherproof terminal box capable of terminating 12 lines. It is used at terminal and test points and can be used as a main frame for small tactical switchboards. (See next page for associated maintenance kit).

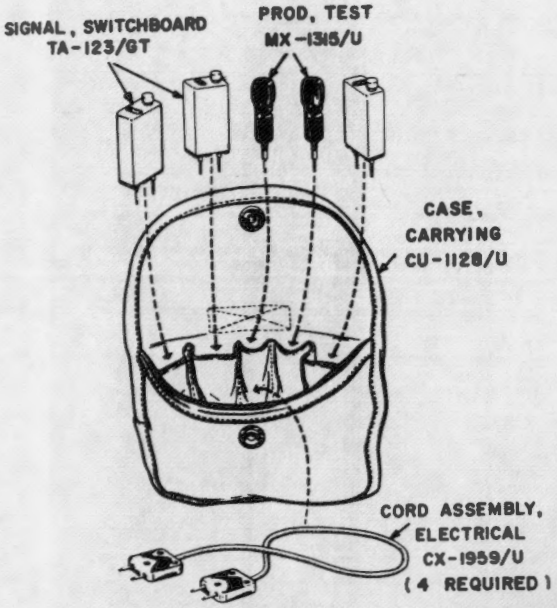


MAINTENANCE KIT,
ELECTRONIC EQUIPMENT MX-842/GT

STATUS: STD-B; FSN: 5805-547-1075
REF: TM 11-2138

GENERAL INFORMATION

The MX-842/GT consists of two test prods, three signal assemblies and four patch cords which provide testing and patching facilities for Terminal Box TA-125/GT.



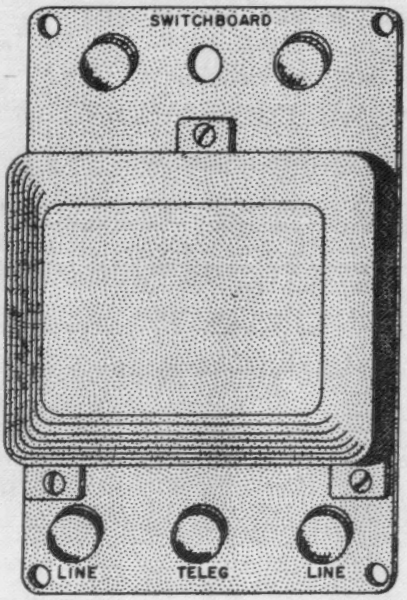
## COIL, TELEPHONE REPEATING C-161

STATUS: STD-A; FSN: 5950-235-8730
REF:

### GENERAL INFORMATION

The C-161 is a highly efficient, 1 to 1 ratio transformer with four windings (21 ohms each). Two windings are connected in series on each side of the transformer. On the secondary side of the transformer the connecting point is extended to provide the telegraph leg of the circuit.

COIL - C - 161

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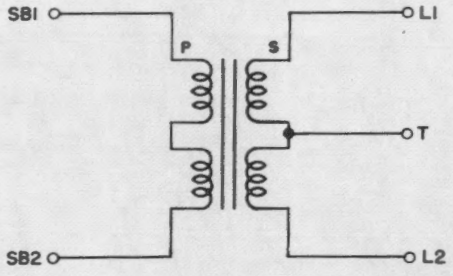



B

## REPEATER, TELEPHONE TA-287/G

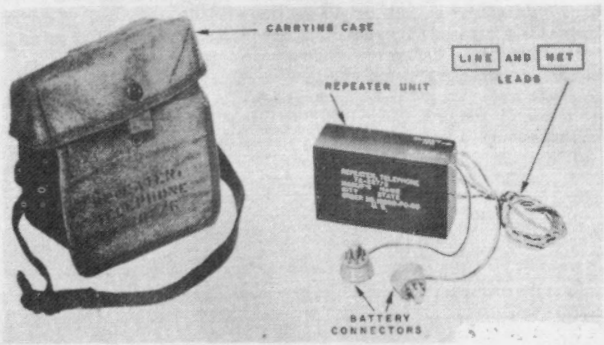
STATUS: STD-A; FSN: 5805-808-9211
REF: TM 11-5805-302-10

### GENERAL INFORMATION

The TA-287/G is a two-way, single-channel, voice-frequency, unattended, battery-powered telephone repeater used at intermediate or terminal locations to improve speech quality and extend the talking range of a field wire (WD-1/TT) telephone circuit. TA-287/G's may be used on any field wire line that will permit adequate signaling (up to approximately 24 miles). The TA-287/G does not extend the signaling range of the system.

### TECHNICAL CHARACTERISTICS

Gain: Approx 6 db at 1,000 Hz, wet.
Frequency band: 300 to 3,500 Hz.
Section length: Equal intervals of 6 miles (±2 miles).
Power req: 22.5 v dc (BA-421/U) and 3 v dc (BA-406/U).
Signaling circuit: Bypass for 90 v, 20 Hz.
Battery life: 3 months.
Weight: 2 lbs with case less batteries.



## Section IV. TELETYPEWRITER EQUIPMENT

### TELETYPEWRITER SET AN/PGC-1

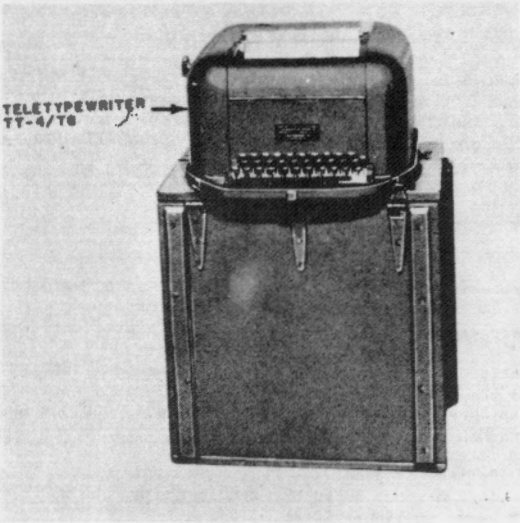
STATUS: STD-A; FSN: 5815-198-5963
REF: TM 11-5815-206-12

#### GENERAL INFORMATION

The AN/PGC-1 is a lightweight, transportable unit which may be used in either fixed-plant or tactical teletypewriter stations throughout the field army. The component Teletypewriter TT-4/TG is used in the ground mobile configurations AN/MGC-17 and AN/MSC-29 (replaced by the AN/TSC-58).

#### TECHNICAL CHARACTERISTICS

Method of transmitting: Standard communications keyboard.
Method of receiving: Page copy (up to 3-ply roll paper).
Type of signal: Neutral (receiving, and sending).
Operation modes: FDX and HDX (normally in HDX).
Speed: Operations per minute (opm): 368.1, 404, 460, or 600.
Words/min: 60, 66, 75, or 100.
Baud rate: 75 (at 100 wpm).
Motor type: Series-governed.
Power req: 105-125 v ac or dc, 50-60 Hz, single-phase (ac), 100w.
Line current req: 20 or 60 ma dc.
Signaling code: Five-unit, start-stop (7.42 unit).
Total weight: 43 lbs (without paper roll).
Major components of AN/PGC-1:
Teletypewriter TT-4/TG as shown.
Case CY-694/PGC-1.
Accessory items.


TELETYPEWRITER
TT-4/TG

## TELETYPEWRITER SET AN/GGC-3

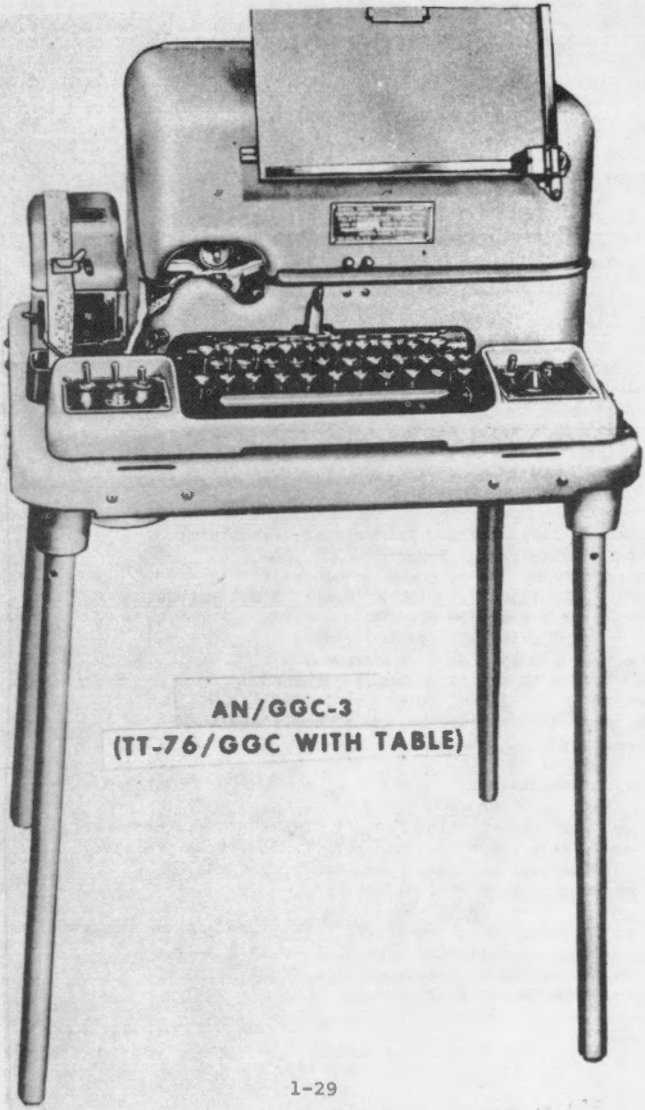
STATUS: STD-A; FSN: 5815-503-3309
REF: TM 11-2815-238-12

### GENERAL INFORMATION

The AN/GGC-3 is a lightweight, transportable unit which may be used in either fixed- or tactical- teletypewriter stations throughout the field army. The component Teletypewriter TT-76/GGC is used in the ground mobile configurations AN/MGC-17, -22, -23, -32, and AN/MSC-29.

### TECHNICAL CHARACTERISTICS
### USING TT-76/GGC

Method of transmitting: Standard communications keyboard or transmitter-distributor.
Method of receiving: Message printed and perforated on 7/8-in paper tape.
Type of signal: Neutral or polar receiving; neutral sending.
Operation modes: FDX or HDX (normally FDX in ground mobile operation).
Speed: Operations per minute (opm): 368.1, 404, 460, or 600.
Words/min: 60, 66, 75, or 100.
Baud rate: 75 (at 100 wpm).
Motor type: Series-governed.
Power req: 115/230 v ac, 50-60 Hz, single-phase, 150 w.
Line current req: Dc line: 60 ma.
Vf line: 20 ma dc.
Polar: 30 ma dc.
Signaling code: Five-unit, start-stop (7.42 unit).
Total weight: 97 lbs.
Major components:
Reperforator-Transmmitter TT-76/GGC.
Table FN-52/GGC.
Case CY-1110/GGC.



AN/GGC-3
(TT-76/GGC WITH TABLE)

## TELETYPEWRITER SET AN/TGC-5( )

STATUS: STD-A; FSN: 5815-543-0721 (AN/TGC-5)
5815-543-1828 (AN/TGC-5A)
5815-543-0720 (AN/TGC-5X)
5815-543-1827 (AN/TGC-5AX)

REF: TM 11-2249-10

### GENERAL INFORMATION

The AN/TGC-5 is a semiautomatic teletypewriter set that sends, receives, and monitors teletypewriter messages. It is used in fixed station tape relay centers or in tributary stations that are part of a tape relay network.

### TECHNICAL CHARACTERISTICS

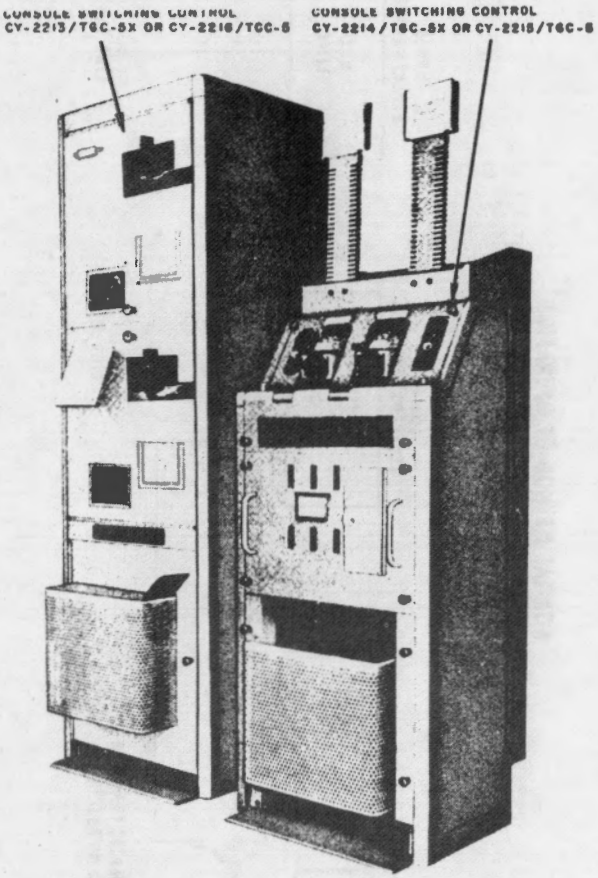
Method of transmitting: Transmitter-distributor.
Method of receiving: Reperforator.
Type of signal: 20 or 60 ma dc neutral;
Speed: Operations per minute (opm): 368.1 or 600.
Words/min: 60 or 100.
Baud rate: 75 (at 100 wpm).
Motor type: AN/TGC-5: synchronous.
AN/TGC-5X: series-governed.
Power req: 105-125 v, 50-60 Hz, 525 w.
Line current: Provided by Power Supply PP-1801/FG.
Signaling code: Five-unit, start-stop (7.42 unit).
Total weight: 526 lbs.
Major components:

AN/TGC-5

1 ea Console, Switching Control CY-2215/TGC-5 (transmit).
1 ea Console, Switching Control CY-2216/TGC-5 (receive).
1 ea Reperforator, Teletypewriter TT-224/TG.
1 ea Power Supply PP-1801/FG.

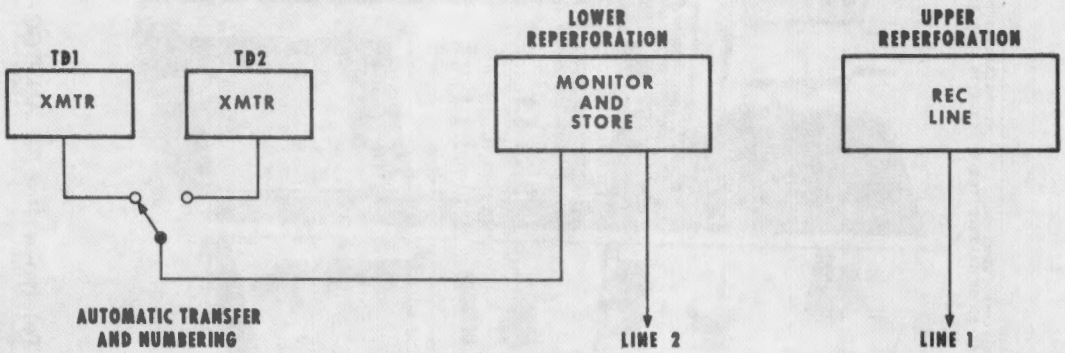
AN/TGC-5X

1 ea Console, Switching Control CY-2214/TGC-5X (transmit).
1 ea Console, Switching Control CY-2213/TGC-5X.
1 ea Reperforator, Teletypewriter TT-225/TG.
1 ea Power Supply PP-1801/FG.




Teletypewriter Set AN/TGC-5.

## NORMAL METHOD OF OPERATION



## TELETYPEWRITER SET AN/FGC-20 AND AN/FGC-20X

STATUS: STD-A; FSN: 5815-503-2652 (FGC-20)
5815-392-7743 (FGC-20X)
REF: TM 11-5815-200-10

### GENERAL INFORMATION

The AN/FGC-20 and AN/FGC-20X provide facilities for transmitting and receiving primarily in the fixed plant situation. The component Teletypewriter TT-98/FG is used in the ground mobile configurations AN/MGC-22, -23, and -32.

### TECHNICAL CHARACTERISTICS

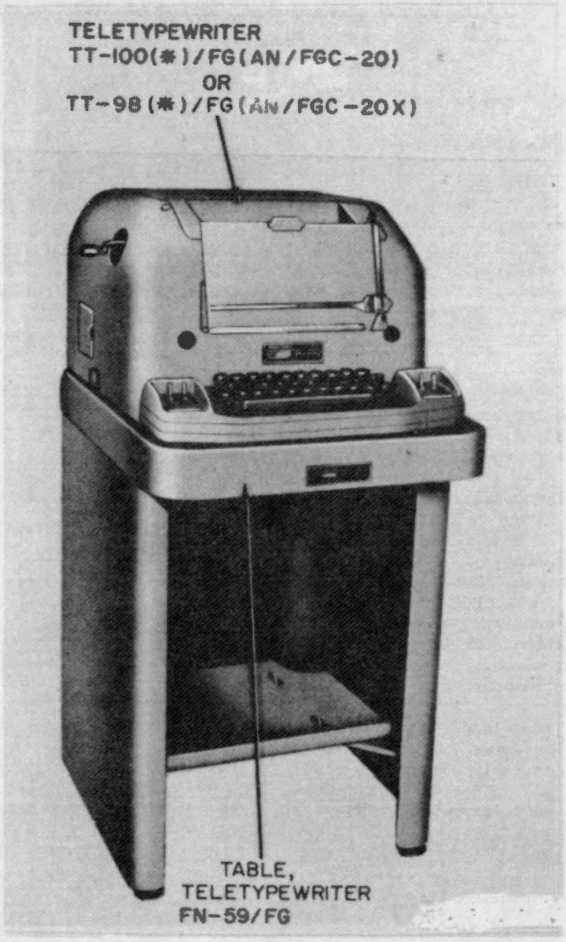
Method of transmitting: Standard keyboard.
Method of receiving: Page printer.
Type of signal: 20 or 60 ma dc neutral; or,
20 or 30 ma dc polar.
Speed: Operations per minute (opm): 368.1, 404, 460, or 600.
Words/min: 60, 66, 75, or 100.
Baud rate: 75 (at 100 wpm).
Motor type: AN/FGC-20: Synchronous.
Power req: 105-125 v, 50-60 Hz.
FGC-20: 120 w. FGC-20X: 150 w.
Line current: Provided by Power Supply PP-978/FG.
Signaling code: Five-unit, start-stop (7.42 units).
Total weight: 87 lbs.
Major components:

AN/FGC-20

1 ea Teletypewriter TT-100/FG.
1 ea Power Supply PP-978/FG.
1 ea Table FN-59/FG.

AN/FGC-20X

1 ea Teletypewriter TT-98/FG, w/PP-978/FG and FN-59/FG.


TELETYPEWRITER
TT-100(*)/FG(AN/FGC-20)
OR
TT-98(*)/FG(AN/FGC-20X)
TABLE,
TELETYPEWRITER
FN-59/FG

## TELETYPEWRITER SET AN/FGC-25 AND AN/FGC-25X

STATUS: STD-A; FSN: 5815-503-3316 (FGC-25)
5815-519-5644 (FGC-25X)
REF: TM 11-5815-244-12

### GENERAL INFORMATION

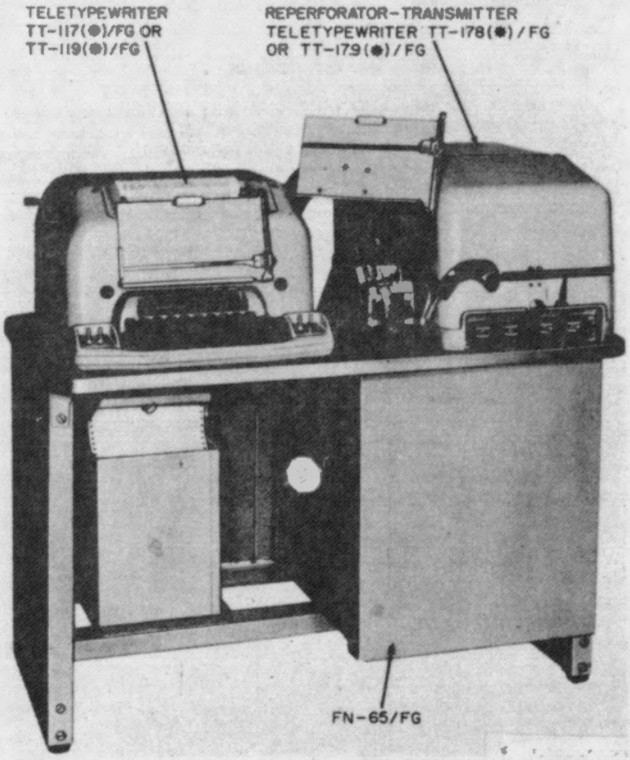
The AN/FGC-25 and the AN/FGC-25X provide facilities for transmitting, monitoring and receiving messages in communications centers. Messages can be transmitted from either the keyboard or the transmitter-distributor, and received on either the page printer or the reperforator. The components TT-119/FG and TT-179/FGC are used in the ground mobile configurations AN/MGC-22 and AN/MGC-32.

### TECHNICAL CHARACTERISTICS

Method of transmitting: Standard keyboard transmitter-distributor.
Method of receiving: Page printer, reperforator.
Type of signal: Transmit: 20 or 60 ma dc neutral.
Receive: 20 or 60 ma dc neutral, or 30 ma dc polar.
Speed: Operations per minute (opm): 368.1, 404, 460, or 600.
Words/min: 60, 66, 75, or 100.
Baud rate: 75 (at 100 wpm).
Motor type: AN/FGC-25: Synchronous
AN/FGC-25X: Series-governed.
Power req: 95-250 v, 50-60 Hz
FGC-25: 380 w. FGC-25X: 440 w.
Line current: Provided by internal rectifier.
Signaling code: Five unit, start-stop (7.42 unit).
Total weight: 192 lbs.
Major components:

AN/FGC-25
1 ea teletypewriter, TT-117/FG.
1 ea reperforator-transmitter, TT-179/FGC.
1 ea table FN-65/FG.

AN/FGC-25X
1 ea teletypewriter, TT-119/FG.
1 ea reperforator-transmitter, TT-178/FGC.
1 ea table, FN-65/FG.


TELETYPEWRITER
TT-117(*)/FG OR
TT-119(*)/FG
REPERFORATOR-TRANSMITTER
TELETYPEWRITER TT-178(*)/FG
OR TT-179(*)/FG
FN-65/FG

## TRANSMITTER-DISTRIBUTORS, TELETYPEWRITER TT-122/FG AND TT-123/FG

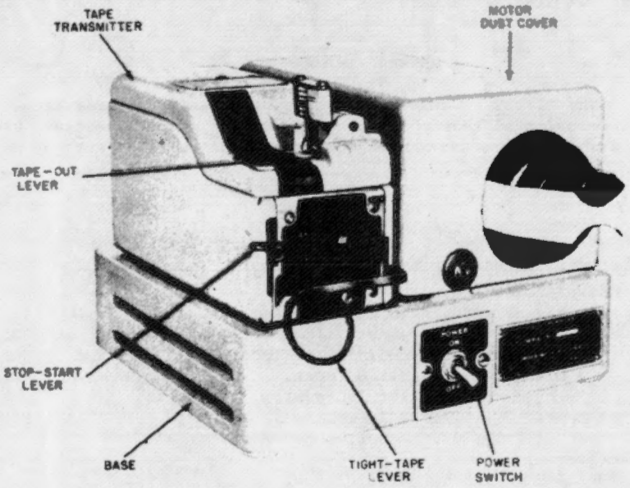
STATUS: STD-A; FSN: 5815-557-6257 (122/FG)
5815-557-6256 (123/FG)
REF: TM 11-2277

### GENERAL INFORMATION

The TT-122/FG and TT-123/FG provide facilities for tape transmission of teletype messages. The teletypewriters are used in fixed station and mobile communications centers, such as AN/MGC-22, 23, and 32.

### TECHNICAL CHARACTERISTICS

Method of transmitting: Transmitter-distributor.
Method of receiving: None.
Type of signal: 20 or 60 ma dc neutral.
Speed: Operations per minute (opm): 368.1, 404, 460, or 600.
Words/min: 60, 66, 75, or 100.
Baud rate: 45 (at 60 wpm).
75 (at 100 wpm).
Motor type: TT-122/FG: Synchronous.
TT-123/FG: Series-governed.
Power req:
TT-122/FG: 115 v, 60 Hz, 115 w.
TT-123/FG: 105 to 125 v, 50-60 Hz, 184 w.
Line current req: 20 or 60 ma.
Signaling code: Five-unit, start-stop (7.42 unit).
Total weight: 17 lbs each.




**Transmitter-Distributor, Teletypewriter TT-123/FG.**

## REPERFORATORS, TELETYPEWRITER TT-107/FG AND TT-109/FG

STATUS: STD-A; FSN: 5815-503-1168 (TT-107/FG)
5815-543-0568 (TT-109/FG)
REF: TM 11-2226

### GENERAL INFORMATION

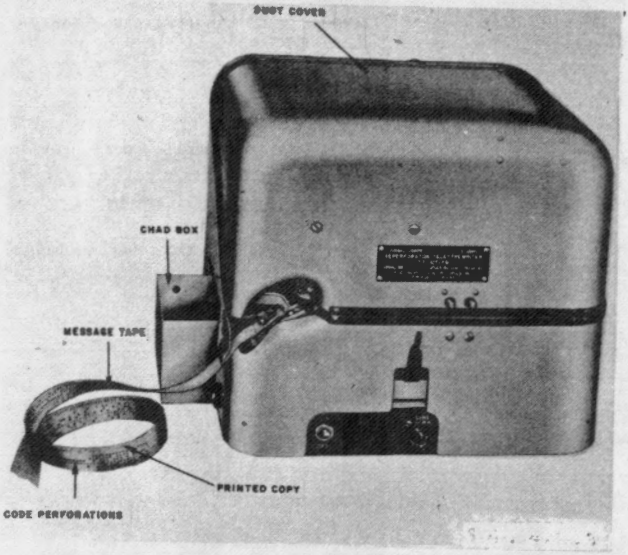
The TT-107/FG and TT-109/FG provide tape reception (only) of teletypewriter messages.

### TECHNICAL CHARACTERISTICS

Configurations: Fixed station or mobile. Mobile configurations include the AN/MGC-22, AN/MGC-23, and AN/MGC-32.
Method of reception: Reperforation.
Type of signal: Dc neutral (20 or 60 ma);
dc polar (30 ma).
Speed: Operations per minute (opm): 368.1, 404, 460, or 600.
Words/min: 60, 66, 75, or 100.
Baud rate: 45 (at 60 wpm).
75 (at 100 wpm).
Motor types: TT-107/FG: Synchronous.
TT-109/FG: Series-governed.
Power req: TT-107/FG; 115 v, 60 Hz, 120 w.
TT-109/FG: 105 to 125 v, 50-60 Hz, 190 w.
Line current req: 20, 30, or 60 ma dc.
Signaling code: Five-unit start-stop (7.42 unit).

### PHYSICAL CHARACTERISTICS

12.3125 (h) x 12.625 (w) x 12.25 (d) inches
1.102 cu ft.
TT-107/FG: 37 lbs. TT-109/FG: 30 lbs.




**Reperforator, Teletypewriter TT-107/FG.**

TELETYPEWRITER SET, FORWARD AREA (FATT)
AN/UGC-72, 73, 74, AND 75

STATUS: D; FSN: see component listing
REF: to be drafted

GENERAL INFORMATION

FATT is the application of electronic techniques to replace electro mechanical mechanisms of current standard teletypewriter equipment. FATT is a family of equipments to provide teletypewriter capabilities over communications facilities for both tactical and administrative applications.

This telecommunications equipment comprises a send-receive page printer, typing reperforator and distributor-transmitter, capable of processing baudot (military interim standard) and ASCII(military standard) codes.

These operational components can be issued for separate installation; or they can be issued in a single package as either a tape and page teleprinter set (ASR), or as a tape-relay-and preparation set. Low level keying and all the controls and indicators necessary for processing 5 bit (7.00 or 8.00 unit), and 8-bit (10.00 or 11.00 unit) codes, makes the equipment fully compatible with the new communications and data systems.

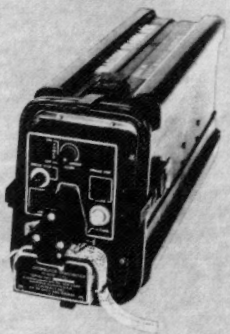
REMARKS: These equipments are still in the developmental stage.

COMPONENT LISTING OF FORWARD AREA
TACTICAL TELETYPEWRITER (FATT)

| | NOUN NAME | NOMENCLATURE | STOCK NUMBERS |
|---|---|---|---|
| 1. | Dist-Transmitter TTY | AN/UGC-72(U)1 | 5815-402-5293 |
| | Dist-Transmitter TTY | TT-409/UG | 5815-008-1842 |
| | Case, Dist-Transmitter | CY-6706/UGC-72 | 5815-494-6419 |
| 2. | Reperforator, TTY | AN/UGC-73(U)1 | 5815-402-5294 |
| | Reperforator, TTY | TT-411/UG | 5815-497-9373 |
| | Case, Reperforator | CY-6707/UGC-73(U) | 5815-494-6420 |
| 3. | Teleprinter | AN/UGC-74(U)1 | 5815-402-5292 |
| | Teleprinter | TT-412/UG | 5815-497-9375 |
| | Case, Teletypewriter | CY-6708/UGC-74(U) | 5815-003-3236 |
| | Teletypewriter | AN/UGC-74(U)2 | 5815-402-5295 |
| | Teleprinter | TT-412/UG | 5815-497-9375 |
| | Keyboard Trans, TTY | TT-561/UG(U)1 | 5815-494-6416 |
| | Case, TTY | CY-6708/UGC-74(U) | 5815-003-3236 |
| | Teletypewriter | AN/UGC-74(U)3 | to be assigned |
| | Teleprinter | TT-412/UG | 5815-497-9375 |
| | Keyboard Trans, TTY | TT-561/UG(U)2 | to be assigned |
| | Case, TTY | CY-6708/UGC-74(U) | 5815-003-3236 |
| 4. | Teletypewriter Set | AN/UGC-75(U)1 | 5815-402-2275 |
| | Reperforator-Dist-Trans | TT-654/UG | 5815-497-9391 |
| | Case, TTY Set | CY 6709/UGC-75(U) | 5815-494-6421 |
| | Teletypewriter Set | AN/UGC-75(U)2 | 5815-402-2274 |
| | Reperforator Dist-Trans | TT-654/UG | 5815-497-9391 |
| | Keyboard Trans, TTY | TT-561/UG(U)1 | 5815-494-6416 |
| | Case, TTY | CY 6709/UGC-75(U) | 5815-494-6421 |
| | Teletypewriter Set | AN/UGC-75(U)3 | to be assigned |
| | Reperforator-Dist-Trans | TT-654/UG | 5815-497-9391 |
| | Keyboard Trans, TTY | TT-561/UG(U)2 | to be assigned |
| | Case, TTY | CY-6709/UGC-75(U) | 5815-494-6421 |

# AN/UGC-72(V) 1

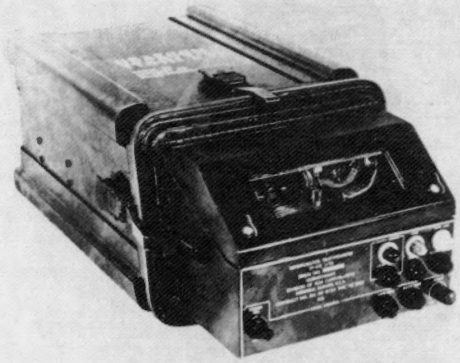
**(Formerly TT-409/TG)**



# Reperforator, Teletypewriter

## AN/UGC-73(V) 1

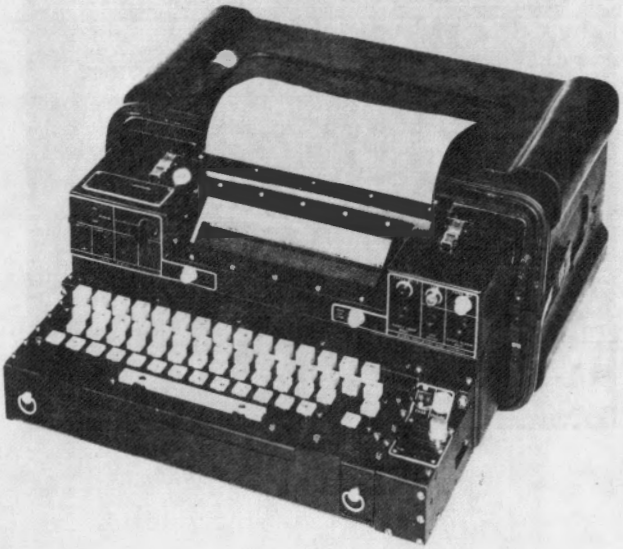
**(Formerly TT- 411/TG)**

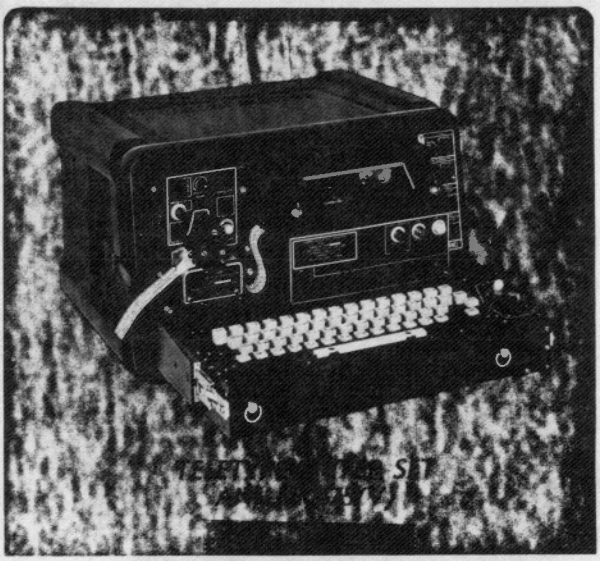


# Teletypewriter

## AN/UGC-74(V)

**(Formerly TT-412/TG)**





## BRIEF DESCRIPTION OF EACH FATT EQUIPMENT

1. Distributor-Transmitter, Teletypewriter AN/UGC-72(U)1 is a tape reader and transmitter, housed in a combination case.

2. Reperforator, Teletypewriter AN/UGC-73(U)1 is a tape punch, housed in a combination case.

3. Teleprinter AN/UGC-74(U)1 is a page printer without keyboard (monitor only) housed in a combination case.

4. Teletypewriter AN/UGC-74(U)2 is a page printer with keyboard with ASCII top plate and keyboards, housed in a combination case.

5. Teletypewriter AN/UGC-74(U)3 is a page printer with keyboard with ASCII topplate and keytops, housed in a combination case.

6. Teletypewriter Set AN/UGC-75(U)1 is a tape relay set without keyboard, housed in a combination case.

7. Teletypewriter Set AN/UGC-75(U)2 is a tape relay and preparation set with keyboard with baudot topplate and keytops, housed in a combination case.

8. Teletypewriter Set AN/UGC-75(U)3 is a tape relay and preparation set with keyboard with ASCII topplate and keytops, housed in a combination case.

## Section V. FACSIMILE EQUIPMENT

### FACSIMILE SET AN/TXC-1

STATUS: STD-A
FSN: 5815-164-7107 (TXC-1, -1A, -1B)
5815-194-9522 (TXC-1C)
5815-503-2711 (TXC-1D)
REF: TM 11-2258

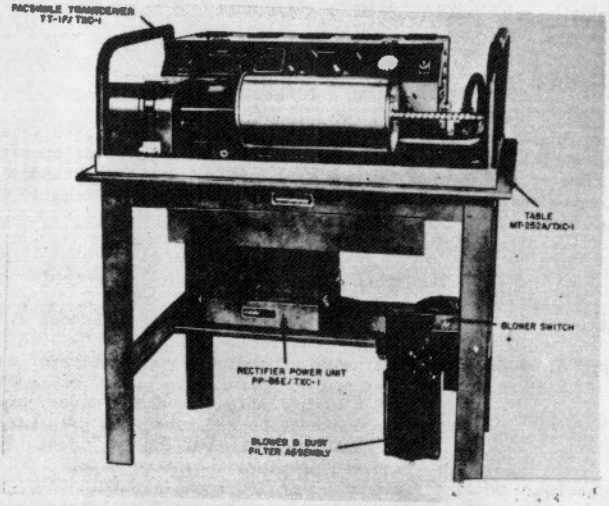
#### GENERAL INFORMATION

The AN/TXC-1 is an electromechanical-optical facsimile set used within the field army for transmission of maps, photographs, sketches, and printed or handwritten text over regular voice communications channels, either wire or radio. Although colored copy may be transmitted, the reproduction is always in black, white, and intermediate shades of gray.

#### TECHNICAL CHARACTERISTICS

Note: Refer to TM for specific differences in models.

Maximum size of copy: 12 by 18 11/16 in.
Size of scanning spot: 1/96 in.
Type of recording: Direct or photographic, positive or negative.
Speed of drum: 60 or 30 rpm.
Lateral movement: 12 inches in 20 or 40 min.
Scanning lines/in: 96.
Index of cooperation: 576 (Drum diameter x scan lines per inch).
Audio carrier frequency: 1,800 Hz.
Type of modulation: AM. (Double sideband plus carrier.)
Frequency band limits: 900 to 2,700 Hz.
Power req: 100 to 130 v, 50-60 Hz, 250 w (at 115 v).
Order wire: Loudspeaker LS-11.
Standby: Mon-Talk Key.
Major components:
Facsimile Transceiver TT-1/TXC-1 (85 lbs)
Rectifier Power Unit PP-86/TXC-1 (48 lbs).
Table MT-252/TXC-1 (86 lbs).
Photographic Equipment PH-549/TXC-1 (83 lbs).
Coupling Unit, Loudspeaker LS-11.


FACSIMILE TRANSCEIVER
TT-1F/TXC-1
TABLE
MT-252A/TXC-1
BLOWER SWITCH
RECTIFIER POWER UNIT
PP-86E/TXC-1
BLOWER & DUST
FILTER ASSEMBLY

## FACSIMILE SET AN/GXC-5

STATUS: DEV; FSN:
REF:

### GENERAL INFORMATION

The AN/GXC-5 is a portable, lightweight, manpacked facsimile set designed for tactical use. The AN/GXC-5 receiver operates automatically (starts, phases, records and stops in standby); however, manual operation is provided in case of automatic failure and for high frequency radio circuit operations.

### TECHNICAL CHARACTERISTICS

Maximum size of copy: 8-1/2 inches wide on a continuous 2,200 inch long roll.
Type of recording: Continuous web using a combination of carbon paper and ordinary white paper, or; multiple copies with duplicator carbon paper, or; overlays and projectables with transparent material, or; adhesive copy on specially prepared pressure sensitive tape.
Scanning: 96 lines/inch at 90 or 180 scans/minute.
Transmission time: 5.50 minutes for an 8-1/2 x 11 inch page at high speed.
Power req: 24 v dc.
Weight: Approximately 90 lbs total.
Major components:
- Receiver, Facsimile R-830/GX.
- Transmitter, Facsimile T-644/GX.
- Power Unit PU-278/TRC-27.

CHAPTER 2

FREQUENCY DIVISION MULTIPLEX (FDM) EQUIPMENT

CONTENTS PAGE

## TERMINALS, TELEPHONE AN/TCC-3 AND AN/TCC-23

STATUS: STD-A; FSN: 5805-503-2648 (TCC-3)
5805-537-7410 (TCC-23)
REF: TM 11-2142

### GENERAL INFORMATION

The AN/TCC-3 is used to provide four channels of telephone communications over either loaded spiral-four cable systems, or radio relay system (such as radio relay set AN/GRC-10), or both, in tandem. When operating over a loaded spiral-four cable system exceeding 40 miles in length, telephone Repeater AN/TCC-5 is required. The AN/TCC-3 provides long distance quality circuits which may be used for telephone, telegraph, telegraph carrier, facsimile or data transmission.

The major components of the AN/TCC-3 are:

1 ea telephone modem TA-219/U.
1 ea amplifier-power supply AM-682/TCC-3.

Note: The AN/TCC-23 includes the AN/TCC-3 plus power unit PE-75 and components.

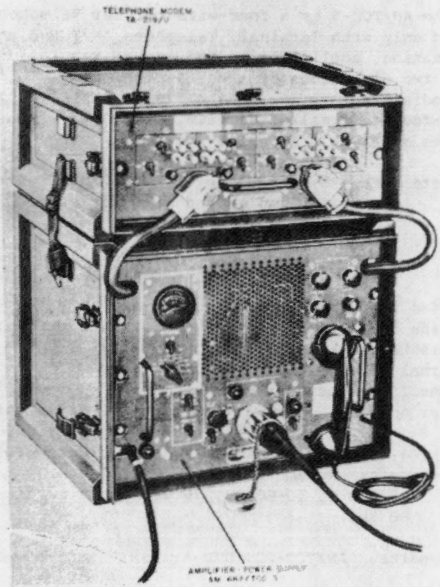
### TECHNICAL CHARACTERISTICS

Number of channels: Four (300-3,500 Hz) channels plus one order-wire channel, or one 16 KHz wide band channel.
Total transmission bandwidth: 0.3 to 19.7 KHz.
Line side operation: Four-wire.
Loop side operation: Two or four-wire.
Transmission media: Loaded spiral four (CX-1606/G) and Radio Set AN/GRC-10.
System Range
Cable: 100 miles using AN/TCC-5's and normal spacing.
Radio: 150 miles using the AN/GRC-10.
Loopside operating levels:
Voice input (two-wire): ODBM (1mw).
Voice input (four-wire): -4DBM (no hybrid).
Voice output (two-wire): -3DBM.
Voice output (four-wire): +1DBM.
Transmitting level to line:
Normal line sections: ODBM.
Long line sections: +10DBM.

Orderwire channel:

Bandwidth: 0.3 to 3.1 KHz.
Signaling frequency: 1600 Hz (attendants rising frequency).

Operating level: 12 DBM when extended.
Alarm circuit: Indicator lamp and buzzer.
Power Req: 115/230 v, 50-60 Hz, 125 watt.




..-134-3-25

## REPEATERS, TELEPHONE AN/TCC-5 AND AN/TCC-22

STATUS: STD-A; FSN: 5805-256-4055
REF: TM 11-2136

### GENERAL INFORMATION

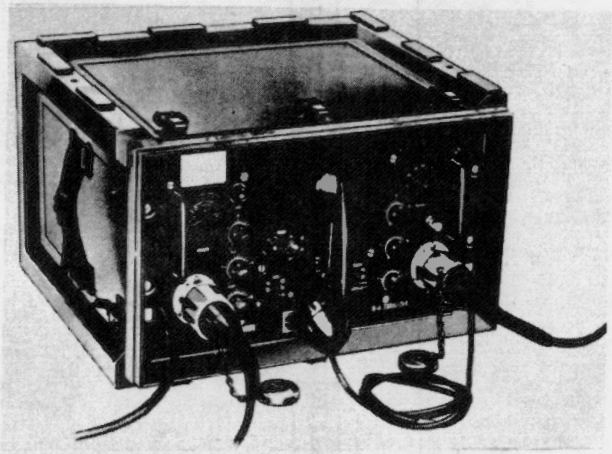
The AN/TCC-5 is a four-wire carrier telephone repeater. It is used only with Terminal, Telephone AN/TCC-3 and provides equalization, amplification and manual regulation of all signals in the two directions of transmission. AN/TCC-5's are used at intermediate points in a system (with AN/TCC-3's) over a loaded spiral-four or similar facility. AN/TCC-5's are normally spaced 25 miles apart in a 100-mile system.

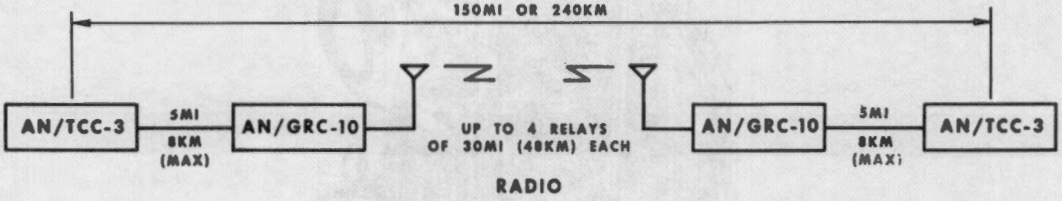
Note: The AN/TCC-22 includes the AN/TCC-5 plus Power Unit PE-214-B and ground accessories.

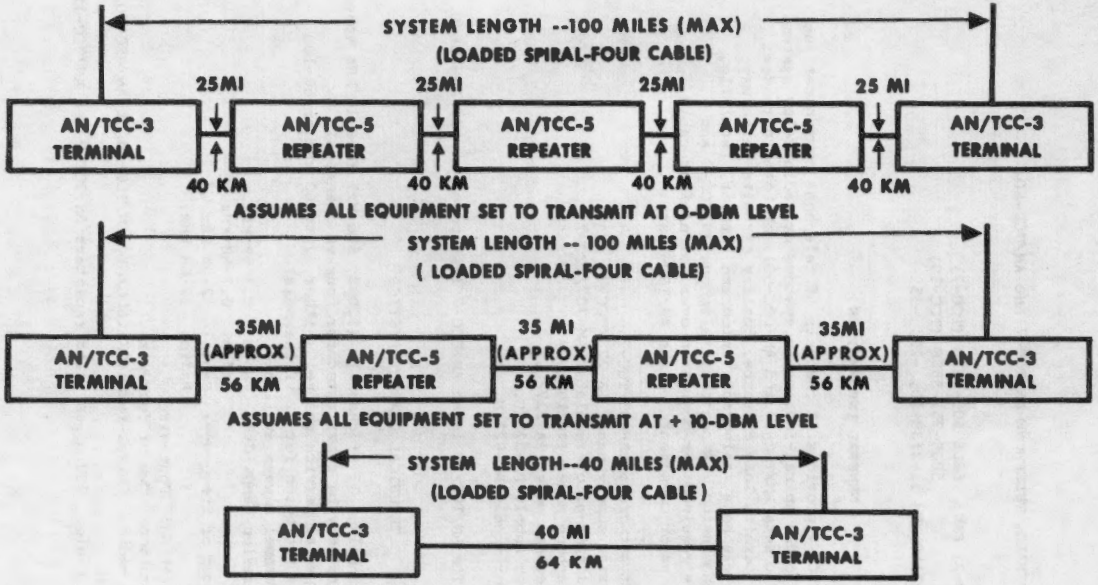
### TECHNICAL CHARACTERISTICS

Amplified frequency range: 0.3 to 19.7 kHz.
Line side operation: Four-wire (both directions).
Transmission level using test tone:
Normal line section: 0 dbm.
Long line section: +10 dbm.
Repeater spacing: Normal line section: 25 miles.
Long line section: 35 miles.
Monitoring, talking or signaling: On order wire only.
Alarm circuit: None.
Power: 115/230 v, 50-60 Hz, 75 w.
Weight: 86 lbs.

Remarks: AN/TCC-22 (STD-A; FSN: 5805-503-1234).




150MI OR 240KM
AN/TCC-3
5MI
8KM
(MAX)
AN/GRC-10
UP TO 4 RELAYS
OF 30MI (48KM) EACH
RADIO
AN/GRC-10
5MI
8KM
(MAX)
AN/TCC-3


SYSTEM LENGTH --100 MILES (MAX)
(LOADED SPIRAL-FOUR CABLE)
25MI
25MI
25MI
25 MI
AN/TCC-3 TERMINAL
AN/TCC-5 REPEATER
AN/TCC-5 REPEATER
AN/TCC-5 REPEATER
AN/TCC-3 TERMINAL
40 KM
40 KM
40 KM
40 KM
ASSUMES ALL EQUIPMENT SET TO TRANSMIT AT O-DBM LEVEL
SYSTEM LENGTH -- 100 MILES (MAX)
( LOADED SPIRAL-FOUR CABLE)
35MI (APPROX)
35 MI (APPROX)
35MI (APPROX)
AN/TCC-3 TERMINAL
AN/TCC-5 REPEATER
AN/TCC-5 REPEATER
AN/TCC-3 TERMINAL
56 KM
56 KM
56 KM
ASSUMES ALL EQUIPMENT SET TO TRANSMIT AT + 10-DBM LEVEL
SYSTEM LENGTH--40 MILES (MAX)
(LOADED SPIRAL-FOUR CABLE)
AN/TCC-3 TERMINAL
40 MI
64 KM
AN/TCC-3 TERMINAL
ASSUMES BOTH TERMINALS SET TO TRANSMIT AT + 10-DBM LEVEL

## TERMINALS, TELEPHONE AN/TCC-7 AND AN/TCC-50

STATUS: STD-A; FSN: 5805-503-1228 (TCC-7)
5805-752-5588 (TCC-50)
REF: TM 11-2150, TM 11-2139-10, -20, -35

### GENERAL INFORMATION

The AN/TCC-7 provides 12 channels of telephone communications over either loaded spiral-four cable systems or radio relay systems (such as radio sets AN/TRC-24 and AN/GRC-50), or both in tandem. The AN/TCC-7 permits long distance, quality circuits which may be used for telephone, telegraph, telegraph carrier, facsimile, and data transmission. Repeaters, telephone AN/TCC-8 and AN/TCC-11 are required for operation over spiral-four cable system. The major components of the AN/TCC-7 are:

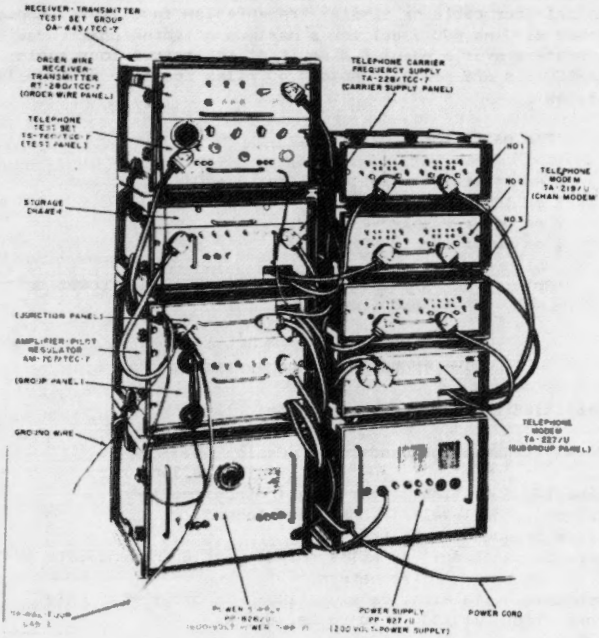
1 ea test set group OA-443/TCC-7.
1 ea carrier supply panel TA-228/TCC-7.
1 ea amplifier-pilot regulator AM-707/TCC-7.
3 ea telephone modem TA-219/U.
1 ea telephone modem TA-227/U.
1 ea power supply PP-826/U.
1 ea power supply PP-827/U.

Note: The AN/TCC-50 is an AN/TCC-7 less power supply PP-826/U.

### TECHNICAL CHARACTERISTICS

Number of channels: 12 vf channels (300-3, 500 Hz) (one 16 kHz special service channel may be substituted for four vf channels).
One 48 kHz special service channel (either 12 to 60 kHz or 60-108 kHz) may be substituted for 12 vf channels).
Order-wire channel always available.
Total transmission bandwidth: Cable: 0.3-99 kHz.
Radio: 0.3-68 kHz.
Amplified group of frequency: Cable: 12-99 kHz.
Radio: 12-68 kHz.
Lineside operation: Four-wire.
Loopside operation: Two or four-wire.
Transmission media: Spiral-four (CX-1606/G), AN/TRC-24 or AN/GRC-50.
System range:
Cable: 200 miles using repeaters AN/TCC-8 and AN/TCC-11.

Radio: 200 miles using radio sets AN/TRC-24 or AN/CRC-50.
Loopside operating levels using test tones:
Voice input (two-wire): 0 dbm.
Voice input (four-wire): -4 dbm.
Voice output (two-wire): -3 dbm.
Voice output (four-wire): +1 dbm.
Transmitting level to line: 0 dbm.
Orderwire channel: Bandwidth 0.3 to 1.7 kHz.
Signaling frequency: (Automatic, regulation, synchronizing, alarm frequency) 68 kHz.
Power req: 115/230 v, 50-60 Hz, 750 w.



## REPEATERS, TELEPHONE AN/TCC-8 AND AN/TCC-21

STATUS: STD-A; FSN: 5805-333-9796 (TCC-8)
5805-692-6778 (TCC-21)
REF: TM 11-2150, TM 11-2140-10, -20, -35

### GENERAL INFORMATION

The AN/TCC-8 is a four-wire carrier telephone repeater. It is used with Terminal, Telephone AN/TCC-7 and provides equalization, amplification, and automatic regulation of all signals in the two directions of transmission. AN/TCC-8's are used at intermediate points in a system (with AN/TCC-7's) over a spiral-four cable or similar transmission facility. Supplies power (100 ma 600 v dc) for a maximum of three unattended repeaters over a phantom circuit of the spiral-four cable. AN/TCC-8's are normally spaced 40 miles apart in a 200 mile system.

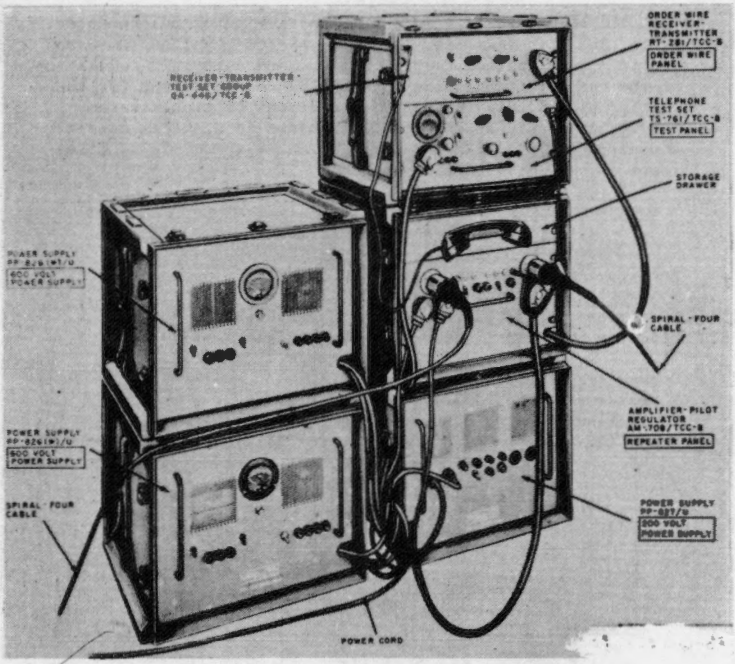
The major components are:

1 ea amplifier-pilot regulator AM-707/TCC-8.
1 ea test set group OA-446/TCC-8.
2 ea power supply PP-826/U.
1 ea power supply PP-827/U.

Note: The AN/TCC-21 is an AN/TCC-8 plus a power unit PE-75 and components.

### TECHNICAL CHARACTERISTICS

Amplified frequency range: Cable: 12-99 kHz.
Radio: 12-68 kHz.
Total transmission bandwidth: Cable: 0.3-99 kHz.
Radio: 0.3-68 kHz.
Lineside operation: Four-wire (both directions).
Transmission level: 0 dbm (test tones).
Alarm frequency: 68 kHz.
Repeater spacing: 40 miles normal with 6 intermediate AN/TCC-11 repeaters.
Monitoring, talking, or signaling: On order-wire only.
Power req: 115/230 v 50-60 Hz, 895 w.


ORDER WIRE RECEIVER-TRANSMITTER AT-281/TCC-8
ORDER WIRE PANEL
RECEIVER-TRANSMITTER TEST SET GROUP OA-648/TCC-8
TELEPHONE TEST SET TS-761/TCC-8
TEST PANEL
STORAGE DRAWER
POWER SUPPLY PP-826/U
600 VOLT POWER SUPPLY
SPIRAL-FOUR CABLE
AMPLIFIER-PILOT REGULATOR AM-708/TCC-8
REPEATER PANEL
POWER SUPPLY PP-826(P)/U
600 VOLT POWER SUPPLY
SPIRAL-FOUR CABLE
POWER SUPPLY PP-827/U
200 VOLT POWER SUPPLY
POWER CORD

## REPEATER, TELEPHONE AN/TCC-11

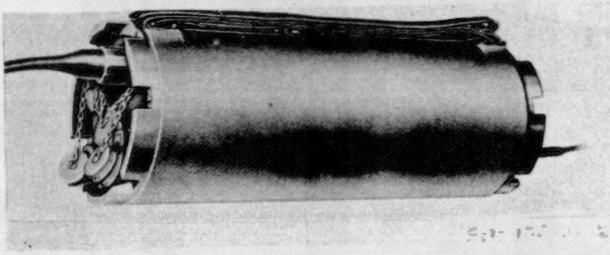
STATUS: STD-A; FSN: 5805-356-2661
REF: TM 11-2150, TM 11-5805-240-12, 35

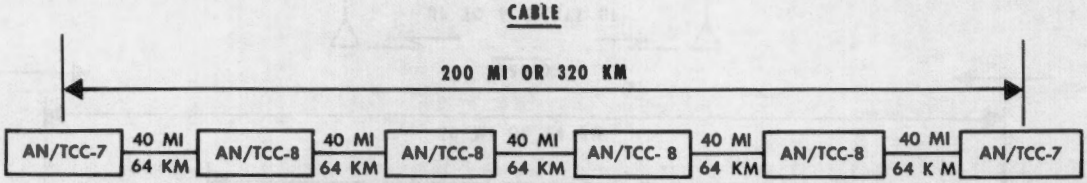
### GENERAL INFORMATION

The AN/TCC-11 is a four-wire carrier telephone repeater. It is used with Terminal, Telephone AN/TCC-7 and AN/TCC-8 and provides equalization, amplification, and automatic regulation of the band of frequencies between 12 kHz and 99 kHz for the carrier signal only in the two directions of transmission. AN/TCC-11 is used at intermediate points in a system over a spiral-four cable. AN/TCC-11 is normally spaced 5-3/4 miles apart in a 40-mile section of cable.

### TECHNICAL CHARACTERISTICS

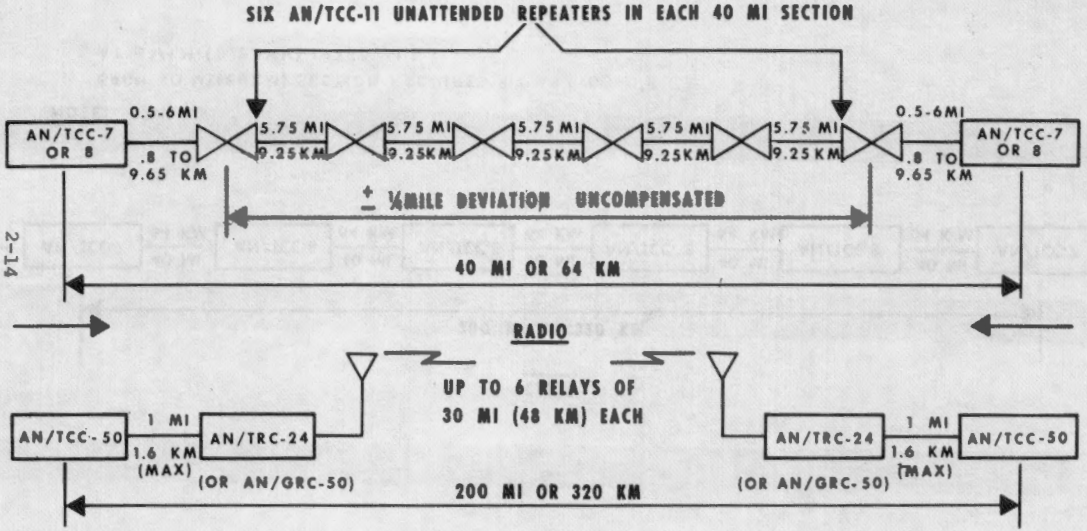
Amplified frequency range: 12 to 99 kHz.
Non-amplified frequency range: 0.3 to 1.7 kHz.
Test frequencies: 99 kHz, 91 kHz, and 83 kHz.
Lineside operation: Four-wire (both directions). Spiral-four cable.
Transmission level: 0 dbm.
Repeater spacing: 5-3/4 mile.
Monitoring, talking or signaling: On order-wire only.
Power req: 148 v dc, 0.1 amp (approx 15 w) obtained from 600 v power supply PP-826/U at attended point, on spiral-four cable on a phantom circuit.






NOTE:

EACH 40 MI(64KM) SECTION REQUIRES SIX AN/TCC-II'S AT 5 3/4 MI(9.25 KM) INTERVALS.


SIX AN/TCC-11 UNATTENDED REPEATERS IN EACH 40 MI SECTION
AN/TCC-7 OR 8
0.5-6MI
.8 TO 9.65 KM
5.75 MI 9.25KM
5.75 MI 9.25KM
5.75 MI 9.25KM
5.75 MI 9.25KM
5.75 MI 9.25 KM
0.5-6MI
.8 TO 9.65 KM
AN/TCC-7 OR 8
± ¼MILE DEVIATION UNCOMPENSATED
40 MI OR 64 KM
RADIO
UP TO 6 RELAYS OF 30 MI (48 KM) EACH
AN/TCC-50
1 MI
1.6 KM (MAX)
AN/TRC-24
(OR AN/GRC-50)
AN/TRC-24
(OR AN/GRC-50)
1 MI
1.6 KM (MAX)
AN/TCC-50
200 MI OR 320 KM

## TERMINALS, TELEGRAPH AN/TCC-4 AND AN/TCC-20

STATUS: STD-A; FSN: 5805-537-7387 (TCC-4)
5805-338-4451 (TCC-20)
REF: TM 11-5805-250-10, -20, and -35

### GENERAL INFORMATION

The AN/TCC-4 and AN/TCC-20 provide full duplex, frequency-shift carrier telegraph channels at a speed of 100 wpm maximum, within a voice-frequency baud of 300-3100 Hz and over a physical or equivalent 4-wire circuit. The AN/TCC-4 provides an 8-channel system and the AN/TCC-20 provides a 4-channel system. These terminals provide for either a voice frequency or a direct current type of loop circuit operation.

The major components are:

AN/TCC-4
1 ea telegraph modem TH-14/T.
2 ea telegraph terminal group TH-13/T.
2 ea telegraph modem assembly TH-15/T.

AN/TCC-20
The AN/TCC-20 consists of 1 ea TH-13 and 1 ea TH-15 only.

### TECHNICAL CHARACTERISTICS

Loop arrangements:
- 2w - vf - HDX.
- 4w - vf - FDX.
- 4w - dc - neutral FDX.
- 4w - dc - tandem - neutral FDX.

Loop signals: Vf - mark 1,325 Hz, space 1,225 Hz.
Dc - mark 20 ma dc, space 0 ma dc.
Loop receiving sensitivity (vf): 0 dbm to -40 dbm.
Ringing in vf loop circuits:
- 20 Hz, 115 v from terminal to loop;
- 20 Hz, 90 v from loop to terminal.

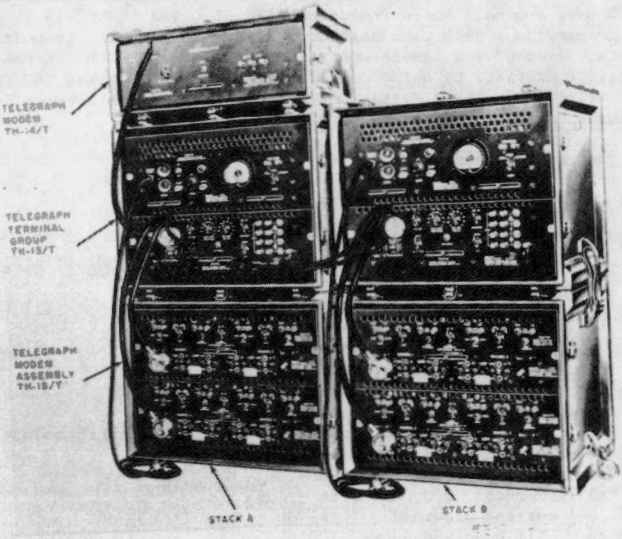
Signaling in line circuits: Channel space frequency operated two seconds minimum.
Break in on half-duplex operation:
Channel space frequency operated two seconds minimum.

Transmission level to line: 0 dbm per channel; composite level adjustable from 0 dbm down in 3 db steps.

Line arrangements:

| Channels req (HDX or FDX) | Transmission facility (carrier chan or physical wire line) | Components required |
|---|---|---|
| 4 | Four-wire | 1 ea TH-13/T;<br>1 ea TH-15/T. |
| 4 | Two-wire | 1 ea TH-13/T;<br>1 ea TH-15/T. |
| 8 | Four-wire | 2 ea TH-13/T;<br>2 ea TH-15/T. |
| 8 | Two-wire | 1 ea TH-14/T;<br>2 ea TH-13/T;<br>2 ea TH-15/T. |
| 12 | Four-wire | 2 ea TH-14/T;<br>3 ea TH-13/T;<br>3 ea TH-15/T. |
| 16 | Four-wire | 2 ea TH-14/T;<br>4 ea TH-13/T;<br>4 ea TH-15/T. |

Power req: 115/230 v, 50-60 Hz.
Power consumption: 240 watts for every four operating channels.


TELEGRAPH MODEM TH-14/T
TELEGRAPH TERMINAL GROUP TH-13/T
TELEGRAPH MODEM ASSEMBLY TH-15/T
STACK A
STACK B

## TERMINAL, TELEGRAPH-TELEPHONE AN/TCC-14

STATUS: STD-B; FSN: 5805-238-9873
REF: TM 11-5805-254-15 (AN/TCC-14)
TM 11-5805-247-12, -35 (TA-182/U)
TM 11-5805-246-10, -20, -35 (TH-5/TG)

### GENERAL INFORMATION

The AN/TCC-14 is a combination of three components which permit simultaneous transmission of frequency-shift telegraph signals and speech over a single voice frequency circuit. The AN/TCC-14 is used to provide speech plus half duplex service in point-to-point, network, switched and remote-control radio systems. Other types of service provided by using one or more components of the AN/TCC-14 are: telegraph only, simultaneous telephone-telegraph service, and alternate telephone-telegraph service.

The major components are:

1 ea Terminal, Telegraph TH-5/TG.
1 ea Filter, Assembly F-98/U.
1 ea Converter, Telegraph, Telephone TA-182/U.

### TECHNICAL CHARACTERISTICS

TH-5/TG

Mark frequency: 1,325 Hz.
Space frequency: 1,225 Hz.
Type of modulation: Frequency shift.
Transmission speed: 60-75 or 100 wpm, based on 7.42 unit code.
Transmitter output level: 0 dbm + or - 2 db.
Receiving sensitivity: 0 to -50 dbm.
Terminal impedance: 600 ohms + or - 10%.
Local loop current provided: 20 ma dc.
Power req: 115 v ac, 50-60 Hz, 100 w.
Ringing generator: 90 v, 20 Hz.

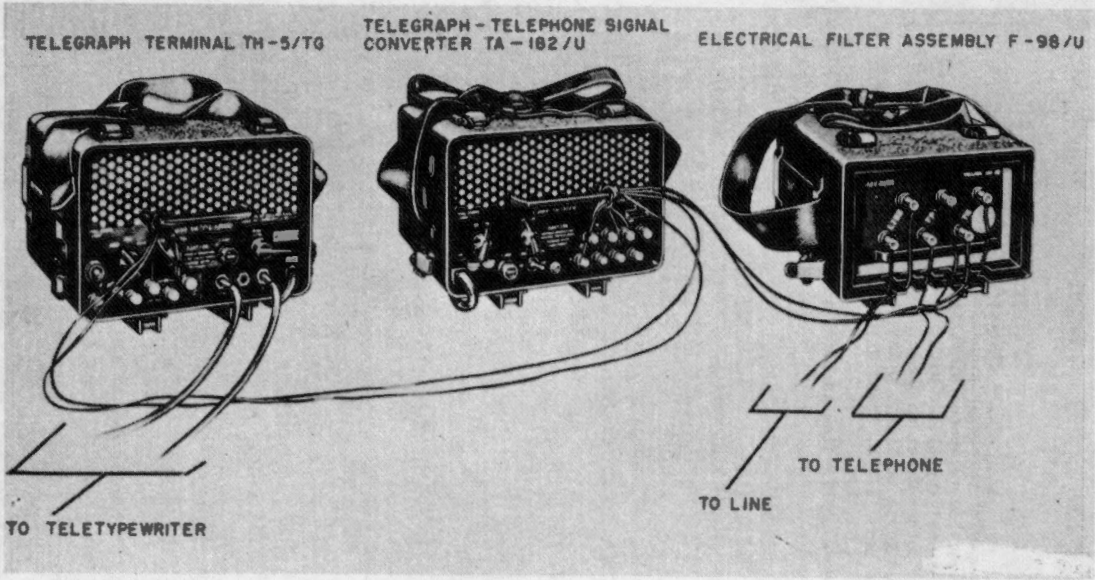
F-98/U

Balanced impedance: 600 ohms input and output.
Attendation: 80 db or more in baud stop regions.
Insertion loss: 4.5 db in telephone path at all filters.
Baud removal loss: 4.5 db in telephone path a first filter only.

TA-182/U

Frequency of telegraph signaling: 1,225 Hz.
Frequency of telephone signaling: 1,600 Hz.
Loop signal input: 20 Hz.
20 Hz output level to loop: 100 volts.
Output level to line: 0 dbm + or - 2 db.
Power req: 115 v, 50-60 Hz, 40 w.

Note: This item is being replaced by the AN/TCC-29 page 2-21.


TELEGRAPH TERMINAL TH-5/TG
TELEGRAPH - TELEPHONE SIGNAL CONVERTER TA-182/U
ELECTRICAL FILTER ASSEMBLY F-98/U
TO TELEPHONE
TO LINE
TO TELETYPEWRITER

## TERMINAL, TELEGRAPH-TELEPHONE AN/TCC-29

STATUS: STD-A; FSN: 5805-902-3087
REF: TM 11-5805-356-12

### GENERAL INFORMATION

The AN/TCC-29 is a combination of three components which permit simultaneous transmission of frequency-shift telegraph signals and speech over a single voice frequency circuit. The TCC-29 is used to provide speech plus half duplex service in point-to-point, network, switched, or remote-control radio systems. Other types of service provided by using one or more components of the AN/TCC-29 are: telegraph only, alternate telegraph-telephone and simultaneous telegraph-telephone service. On high-grade long distance circuits, the telephone circuit will be degraded to terminal grade quality when the TCC-29 is used.

Major components of the TCC-29 are:

1 ea Terminal, Telegraph TH-22/TG.
1 ea Electrical Filter Assembly F-316/U.
1 ea Converter, Telephone-Telephone Signal CV-425/U.

### TECHNICAL CHARACTERISTICS

TH-22/TG

Mark frequency: Mode 1---1,317.5 Hz.
Mode 2---1,402.5 Hz.
Space frequency: Mode 1 or 2 ---1,232.5 Hz.
Type of modulation: Frequency shift.
Transmission speed: Mode 1---60, 75 or 100 wpm (max).
Mode 2---200 wpm (max).
Transmitter output level: 0 dbm + or - 2 db.
Receiver sensitivity: Low 0 to -30 dbm.
High 0 to -48 dbm.
Terminal impedance: 600 ohms.
Local loop current provided: 20 ma dc.
Signaling: 1,232.5 Hz or 20 Hz.
Break in frequency: 1,180 Hz.

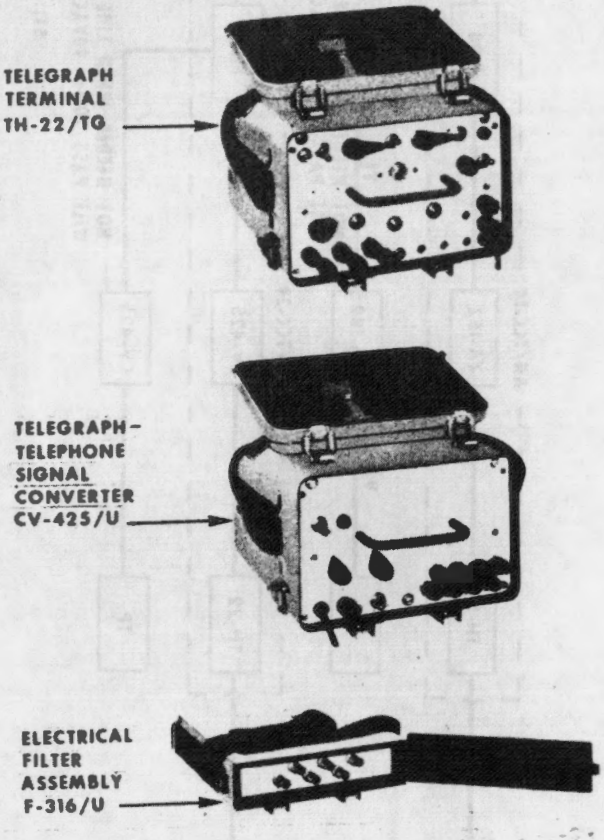
F-316/U

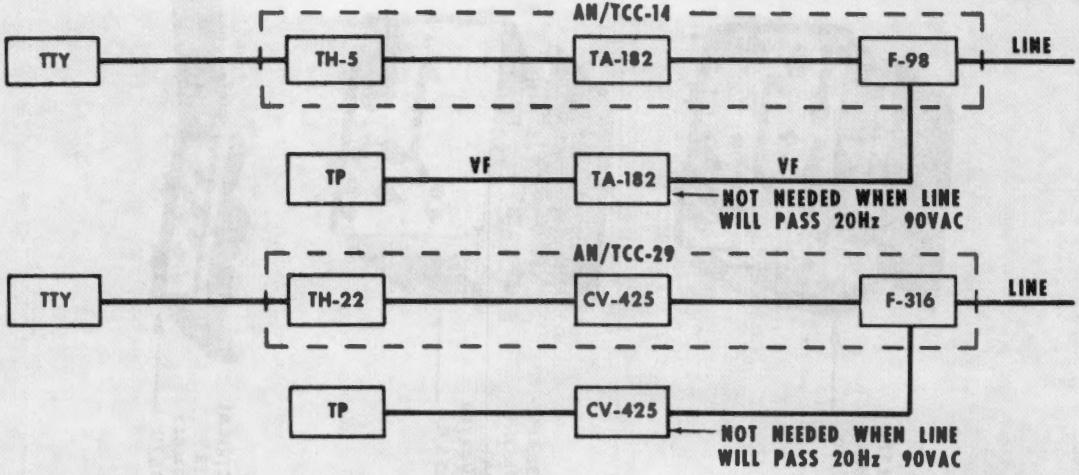
Mid frequency operations: 1,275 Hz.
Balanced impedance: 600 ohms input and output.

Attendation: 80 db or greater in baud stop regions.
Insertion loss: Telegraph side - 4 db max.
Telephone side - 4 db max.

CV-425/U

Signal to line:
Frequency of telegraph signaling: 1,232.5 Hz.
Frequency of telephone signaling: 1,600 Hz.
Loop signal: 20 Hz.
20 Hz output level to loop: 90 volts.
Output level to line: 0 db (+ or - 2db).
Receiver sensitivity on lineside: Low: 30 dbm.
High: 48 dbm.
Power req: 115/230 v ac, 50-60 Hz, 25 watt, dc - 26 v, 24 watt (battery).


TELEGRAPH
TERMINAL
TH-22/TG
TELEGRAPH-
TELEPHONE
SIGNAL
CONVERTER
CV-425/U
ELECTRICAL
FILTER
ASSEMBLY
F-316/U


AN/TCC-14
TTY
TH-5
TA-182
F-98
LINE
TP
VF
TA-182
VF
NOT NEEDED WHEN LINE
WILL PASS 20Hz 90VAC
AN/TCC-29
TTY
TH-22
CV-425
F-316
LINE
TP
CV-425
NOT NEEDED WHEN LINE
WILL PASS 20Hz 90VAC

ST11-154-3-37

CHAPTER 3

# TIME DIVISION MULTIPLEX (TDM) EQUIPMENT

CONTENTS PAGE

## MULTIPLEXER SET AN/TCC-13

STATUS: STD-B; FSN: 5805-941-0865
REF: TM 11-2141

### GENERAL INFORMATION

The AN/TCC-13 is used with radio equipment such as the AN/TRC-29 to provide twenty-three channels of telephone communication over a radio relay system. Two AN/TCC-13 terminals at each end of a system can be used for 45 simultaneous telephone channels over a single RF channel. The AN/TCC-13 will provide long distance quality circuits for telephone, teletypewriter, facsimile and data transmission. The major components of the AN/TCC-13 are:

1 ea test equipment rack which includes:
- 1 ea Oscilloscope OS-25/G.
- 1 ea Audio Test Set TS-762/TC.
- 1 ea Control Monitor C-1151/TC.
- 1 ea Accessories Case CY-1334/G.
- 1 ea Power Supply PP-691/G.

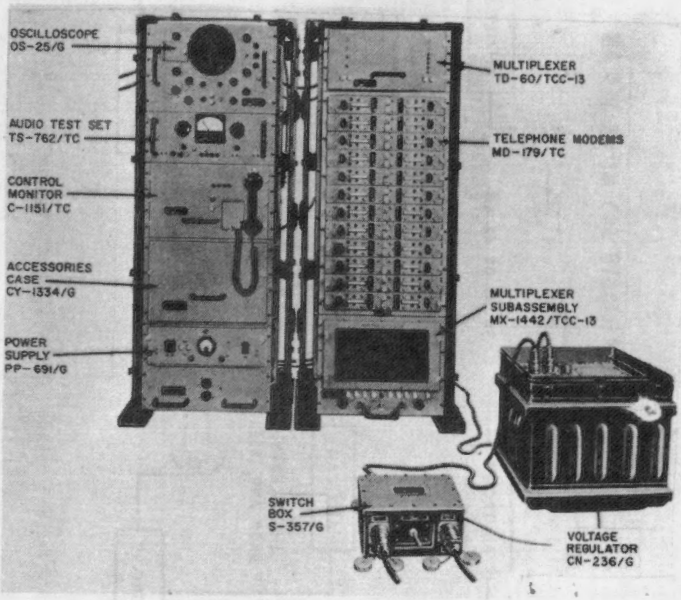
1 ea multiplexer rack which includes:
- 1 ea Multiplexer TD-60/TCC-13.
- 24 ea Telephone Modem MD-179/TC.
- 1 ea Multiplexer Subassembly MX-1442/TCC-13.
- 1 ea Voltage Regulator CN-236/G.
- 1 ea Switch Box SA-357/G.

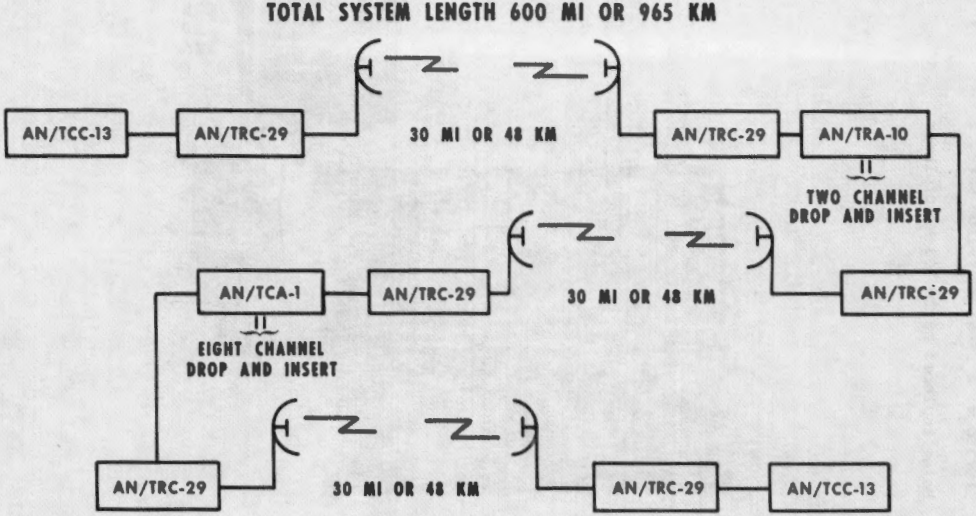
### TECHNICAL CHARACTERISTICS

Number of channels: 23 (audio).
Type of modulation: Pulse Position (ppm).
Total transmission bandwidth: 1 mHz.
Line side operation: 4 wire at 50 ohms.
Loop side operation: 2 or 4 wire at 600 ohms.
Transmission media: Radio Set AN/TRC-29.
System range: 600 miles.
Channel bandwidth: 300-3,500 Hz.
Signaling: 20 Hz.
Loop side operating levels:
- Voice input (two-wire): 0 dbm.
- Voice input (four-wire): -4 dbm.
- Voice output (two-wire): -3 dbm.
- Voice output (four-wire): 0 dbm.

Video transmit level to line: 0.5 volt peak.
Power req: 115/230 v, 47.5-63 Hz, 1,100 watt.

Note: Being replaced by TD-203 Multiplexer.




TOTAL SYSTEM LENGTH 600 MI OR 965 KM
AN/TCC-13
AN/TRC-29
30 MI OR 48 KM
AN/TRC-29
AN/TRA-10
TWO CHANNEL
DROP AND INSERT
AN/TRC-29
AN/TCA-1
AN/TRC-29
30 MI OR 48 KM
EIGHT CHANNEL
DROP AND INSERT
AN/TRC-29
30 MI OR 48 KM
AN/TRC-29
AN/TCC-13

## MULTIPLEXER GROUP AN/TCA-1

STATUS: STD-B; FSN: 5805-309-3342
REF: TM 11-2141

### GENERAL INFORMATION

The AN/TCA-1 is primarily used as a drop and insert terminal at a radio relay link in a multichannel microwave radio-relay communications network. It provides eight independent vf communications channels at a repeater station in a system using AN/TCC-13's and is also used to restore the 23- or 45-channel video pulse train to a standard wave shape. Major components of the AN/TCA-1 are:

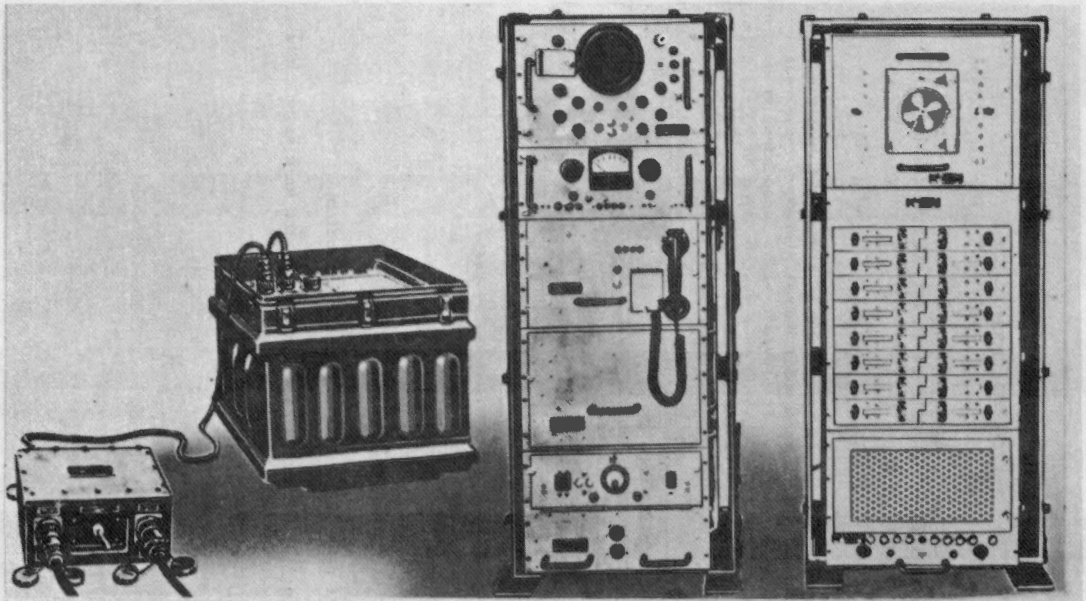
1 ea test rack which includes:
- 1 ea Oscilloscope OS-25/G.
- 1 ea Audio Test Set TS-762/TC.
- 1 ea Control Monitor C-1151/TC.
- 1 ea Accessories Case CY-1334/G.
- 1 ea Power Supply PP-691/G.

1 ea multiplexer rack which includes:
- 1 ea Pulse Form Restorer TD-68/G.
- 16 ea Telephone Modem MD-179/TC.
- 1 ea Multiplexer Subassembly MX-1442/TC.
- 1 ea Voltage Regulator CN-236/G.
- 1 ea Switchbox SA-357/G.

### TECHNICAL CHARACTERISTICS

Number of channels: 8 audio in each direction.

Note: All other characteristics are the same as Multiplexer Set AN/TCC-13.



Multiplexer Group AN/TCA-1.

## PULSE FORM RESTORER GROUP AN/TRA-10

STATUS: STD-A; FSN: 5820-538-3816
REF: TM 11-2141

### GENERAL INFORMATION

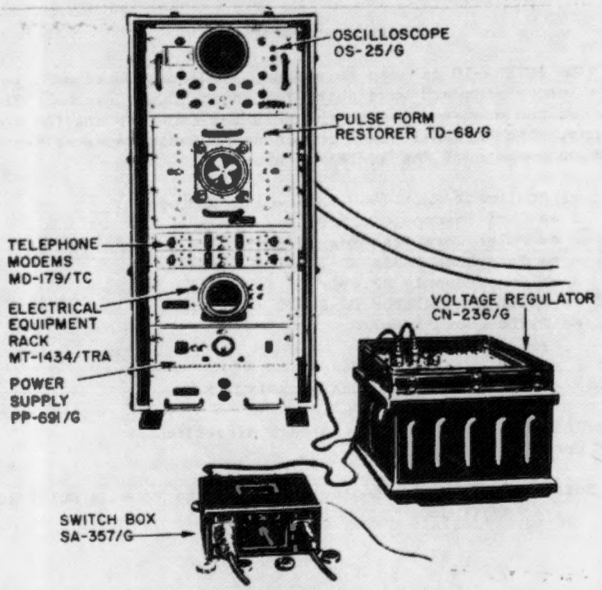
The AN/TRA-10 is used to reshape a 23- or 45- channel pulse train into a standard wave shape for an AN/TCC-13 system. It also provides two drop-and-insert channels for repeater station communications. The AN/TRA-10 is a component of Radio Repeater Set AN/TRC-40. Major components of the AN/TRA-10 are:

1 ea Equipment Rack (960 lbs) which includes:
  1 ea Oscilloscope OS-25/G.
  1 ea Pulse Form Restorer TD-68/G.
  4 ea Telephone Modem MD-179/TC.
  1 ea Power Supply PP 691/G.
1 ea Voltage Regulator CN-236/G (290 lbs).
1 ea Switch Box SA-357/G.

### TECHNICAL CHARACTERISTICS

Number of channels: 2 audio in each direction.
Power consumption: 785 watts.

Note: All other characteristics are the same as Multiplexer Set AN/TCC-13.




**Pulse Form Restorer Group AN/TRA-10.**

## CONVERTER, TELEPHONE SIGNAL CV-1548/G

STATUS: STD-A; FSN: 5805-069-8795
REF: TM 11-5805-367-12, -35/5

### GENERAL INFORMATION

The CV-1548 is a companion unit to multiplexers TD-660/G, TD-352/U and TD-353/U which do not have internal signaling or hybrid facilities. The converter provides signaling and hybrid facilities for 2-way transmission over 12 speech channels. The speech and signaling circuits in the CV-1548 are compatible with those in Switchboards, Tel Manual SB-22/PT and SB-86/P, Manual Telephone Central Office AN/TCC-7, and Telephone Set TA-312/PT.

### TECHNICAL CHARACTERISTICS

Number of channels: 12.
Operating modes: 20-Hz signaling, 2-wire.
Plug supervision signaling, 2-wire.
No signaling, 2-wire (hybrid only in use).
No signaling, 4-wire (channel patched through).
20-Hz signaling, 2-wire:
From subscriber: 20-Hz.
To subscriber: 20-Hz.
Plug supervision signaling:
2-wire: Opens or closes (T) and (R) ring lead circuit.
Multiplex terminal inputs and outputs:
4-wire (all signaling modes):
From multiplex terminal: No tone or 1,600 Hz inband tone between -25 and 0- dbm.
To multiplex terminal: No tone or 1,600 Hz inband tone at -15 dbm (adjustable $\pm$ 5 db).
Channel characteristics (2-wire):
Insertion loss: 4.5 db maximum (250 to 3,500 Hz).
Input and output impedance: 600 ohms (balanced to ground).
Power req: 109 to 121 v, 47 to 420 Hz, 17 w (idle), 60 w (all channels ringing).

### ANCILLARY ITEMS

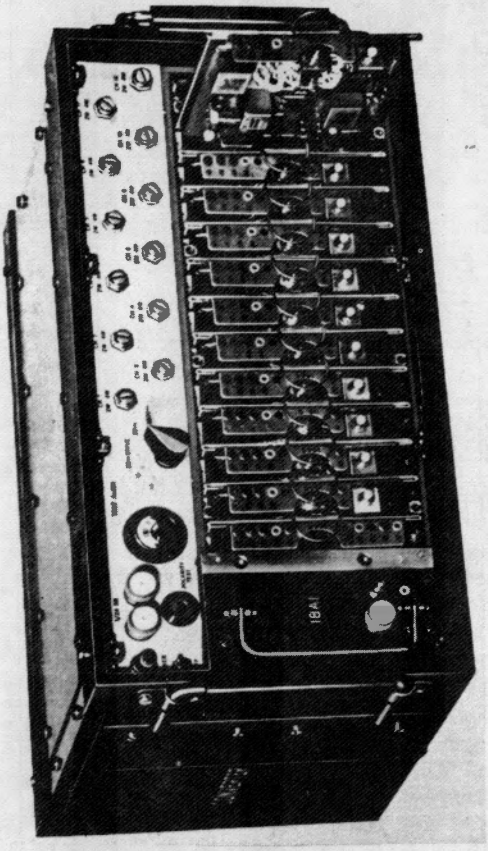
Used with:
Power cable, CX-11173/U(1).
Audio cable, CX-9088/U(3) (loop equip).

Audio cable, CX-7870/TCC(3) to low and medium traffic multiplexer.
CX-7873/TCC(3) to high traffic multiplexer.

PHYSICAL CHARACTERISTICS

8-1/2 (h) x 17-1/4 (w) x 12 (d) inches, 54 lbs.

| Type of circuit loop connection | Operating mode to be used | CH 2W 4W switch | Signaling mode switch | AN/TTC-7, type of relay case to be used | SB-86/P switch | |
|---|---|---|---|---|---|---|
| | | | | | Line selector | Civ trunks |
| 2-wire civilian trunk circuit from SB-86/P. 2-wire trunk circuit from AN/TTC-7. | Plug supervision, originate. (Furnish battery). | 2W | OR | TA-226/TTC | M | ON |
| 2-wire CBS circuit from SB-86/P. 2-wire CB trunk circuit from AN/TTC-7. | Plug supervision, terminate. | 2W | TR | TA-224/TTC or TA-223/TTC. | C | OFF |
| 2-wire LB trunk circuit from SB-86/P. 2-wire LB trunk circuit from AN/TTC-7. 2-wire LB from field telephone. | 20 Hz ringing. | 2W | AC | TA-223/TTC | M | OFF |
| 4-wire voice frequency equipment | No signaling (straight through patch). | 4W | OFF | | | |
| 2-wire voice frequency equipment | No signaling (hybrid in use). | 2W | OFF | | | |



**Converter, Telephone Signal CV-1548/G.**

## MULTIPLEXER SET TD-660/G

STATUS: STD-A; FSN: 5820-930-8079
REF: TM 11-5805-382-12, -35

### GENERAL INFORMATION

The TD-660/G provides 6 or 12 channels of telephone communications over a radio relay system (as used with radio relay set AN/GRC-103); over coaxial cable; or, over both in tandem. It also provides long distance, quality circuits for telephone, teletypewriter, facsimile, and data transmission. When the TD-660/G is operated (6 or 12 channel) with the AN/GRC-103, a radio combiner is not required. Multiplexer Set TD-204 (or TD-754 developmental item) and pulse form restorers TD-206/U's are required with the TD-660/G for 6 or 12 channel operation over cable. When two TD-660/G's are used for 24 channel operation over the AN/GRC-103, Multiplexer Set TD-202/U is required; and for 12- or 24- channel operation over cable, either Multiplexer Set TD-204/U or TD-754/U developmental may be used.

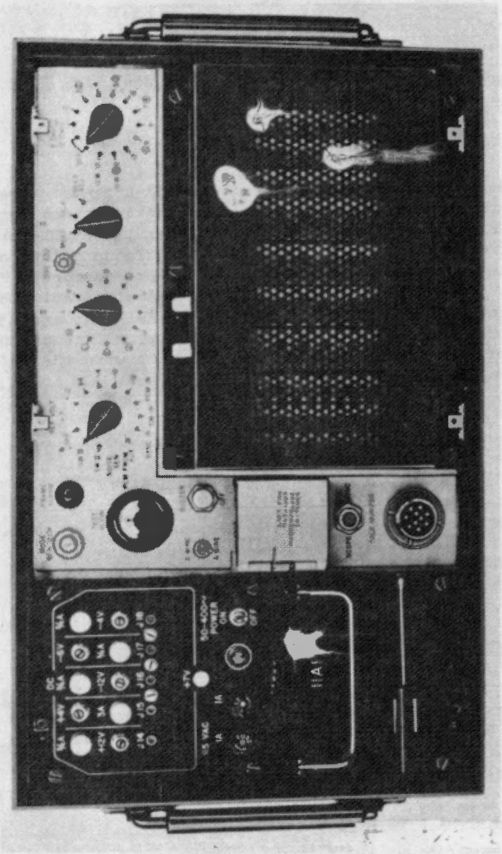
### TECHNICAL CHARACTERISTICS

Number of channels: 6 or 12 audio 4-wire (plus order wire provided by radio or cable combiner).
Type of multiplexing: TDM.
Type of modulation: Pulse Code (PCM).
Number of PCM digits: 6 per channel (sampling).
Modulating bandwidth: 300-3,500 Hz.
Audio input and output impedance: 600 ohms balanced.
Signal to noise ratio: More than 55 dbm.
Sig-to-noise plus crosstalk: More than 53 db.
PCM input-output impedance: 91 ohms.
Pulse rate:
    6-channel: 288 kHz.
    12-channel: 576 kHz.
Channel interval:
    6-channel: 48 kHz.
    12-channel: 96 kHz.
Frame interval: 8 kHz.
Transmission media: Radio Set AN/GRC-103 or Coaxial Cable CX-4245 used in construction with Multiplexer Set TD-204 or TD-754.

System range: 240 miles (normal planning with repeaters).
Channel sampling rate: 8,000 samples/sec.
Pulse type:
    6/12 channel radio: Binary.
    12/24 channel cable: Binary dipulse (from TD-204 or TD-754).
Radio Set 6 or 12 channel: AN/GRC-103(U).
Power req: 109-121 v, 50-400 Hz, 60 watt

ANCILLARY ITEMS

Used with:
    Handset H-154/(U) (monitoring).
    Power Cable, CX-10630/G.
    RF Cable, 1040B/U (3).
    Audio Cable, CX-7870 (3).



**Multiplexer Set TD-660/G.**

## MULTIPLEXER TD-754/G

STATUS: STD-D; FSN: 5820-930-8078
REF: TM-11-5805-383-12

### GENERAL INFORMATION

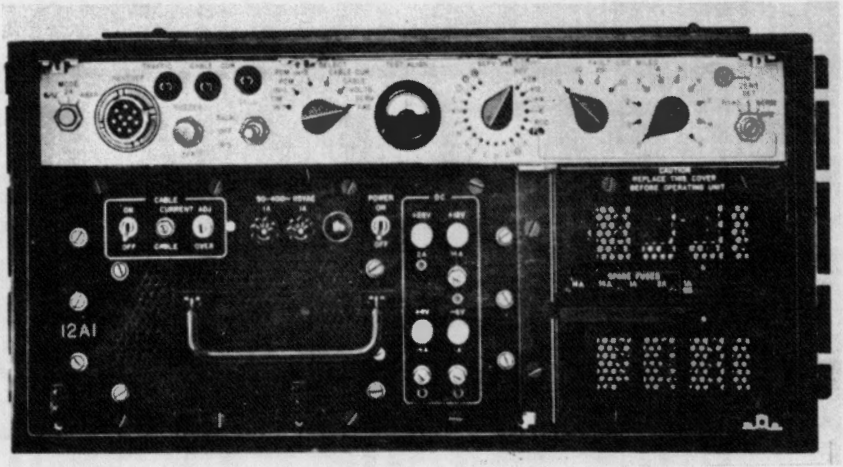
The TD-754/G is used at cable terminals and attended repeater locations in a multiplex system to condition the input and output signal of a PCM multiplexer (such as Multiplexer TD-660/G) for transmission over Coaxial Cable. The TD-754/G also provides order-wire facilities for cable and power for pulse form restorers TD-206/G's used IAW cable system. One TD-754/G is required at a cable to radio conversion point, and two TD-754/G's are required at an attended cable repeater location. Attended cable repeater points are placed at 40-mile intervals (maximum) in a cable system, with TD-206/G's required at 1-mile intervals (maximum).

### TECHNICAL CHARACTERISTICS

Channel capacity: 6, 12, 24, or 48 (full width PCM).
Signaling output freq: 1,600 Hz.
Test tone freq: 1,075 plus-or-minus 50 Hz.
Fault indicator: Traffic lamp and audible alarm.
Cable current output: Adjustable from 30-50 ma.
Power req: 109-121 v ac, 47-420 Hz, 35 watt.

### ANCILLARY ITEMS

Used with:
- Handset, H-156/U.
- HF Cable: CG-2437/U(1) and CG-2438/U(1) to CX-4245/U.
- PCM Cable: CG-1040/U (4) to multiplexer.
- Power Cable: CX-11173/U.




Multiplexer (Cable Combiner) TD-754/U.

## PULSE FORM RESTORER TD-206/G

STATUS: STD-A; FSN: 5895-868-8078
REF: TM 11-5805-367-12, -35/4

### GENERAL INFORMATION

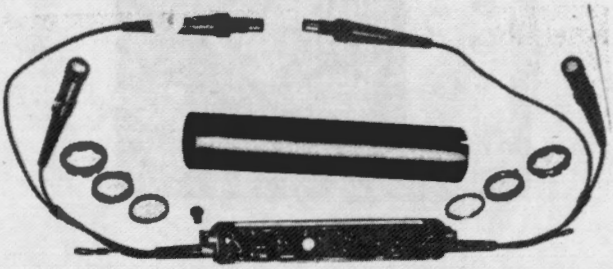
The TD-206/G is used with CX-4245/U or CX-11230/U in a cable system to retime and regenerate the original pulse train in both directions of transmission. Thus, the TD-206/G eliminates distortion caused by noise and by bandwidth limitations. The distribution of TD-206/G's in a cable system is 1 mile and 39 restorers can be used before an attended repeater site is required. Power for the TD-206/G's is provided by the TD-204/U; or TD-754/G at the attended repeater site.

### TECHNICAL CHARACTERISTICS

Input and output signal:
    Impedance: 62 ohms.
    Amplitude:
      Input: 30 mv pp max; 10 mv pp min.
      Output: Leading edge of pulse 2 v from 0 to peak.
Order-wire channel: Not amplified.
Pulse type: Binary dipulse.
Pulse rate: 2.304 MHz.
Power req: 38 ma constant current supplied by TD-204/U.

### PHYSICAL CHARACTERISTICS

2-9/32 inches diameter by 12 inches long.



## PULSE FORM RESTORER TD-982(XE-1)/G

STATUS: D; FSN: to be assigned
REF: Draft TM 11-5805-624-12

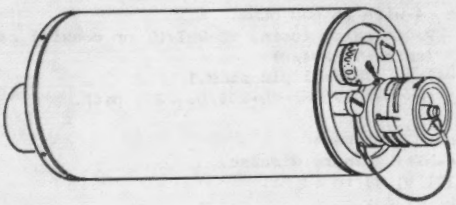
### GENERAL INFORMATION

The TD-982(XE-1)/G is used in conjunction with the TD-976(XE-1)/G multiplexer (developmental) to eliminate the signal distortion as a result of attendation of the super group bit stream by the cable transmission system. The TD-982(XE-1)/G eliminates this distortion by completely regenerating the super group bit stream at 1/2 mile intervals along the cable path. The TD-982(XE-1)/G is a cylindrical unit with receptacles at each end for cable connections.

### TABULATED DATA

Compatible cable----------CX-11230 or CX-4245.
Power req----------45 ma dc (supplied by Multiplexer TD-976(XE-1)/G
Power consumptions----------600 milliwatts.
Dimensions:
Diameter----------4.13 inches
Length----------10.50 inches
Weight----------5.00 lbs.

Remarks: This item is still in the developmental stage.



## MULTIPLEXER TD-352/U

STATUS: STD-A; FSN: 5805-900-8199 (352/U)
REF: TM 11-5805-367-12, -35/3.

### GENERAL INFORMATION

The TD-352/U converts 12 four-wire voice-frequency channels (two TD-352/U's for 24-channels) to a tdm-pcm signal for transmission either over a radio relay system, or over coaxial cable, or over both in tandem. It also reconverts a received tdm-pcm signal to 12 channels. The TD-352/U provides long distance, quality circuits which may be used for telephone, teletypewriter, facsimile, and data transmission. A radio combiner (TD-202/U) is required with TD-352/U for operation over radio relay systems. A cable operation over radio relay systems. A cable combiner (TD-204/U) and pulse form restorers (TD-206/G's) are required with the TD-352/U for operation over coaxial cable systems. Two TD-352/U's and one TD-202/U (radio combiner) or one TD-204/U cable combiner will provide 24-channel operation.

### TECHNICAL CHARACTERISTICS

4-wire vf channels: TD-352/U...12.
Channel sampling rate: 8 kHz.
Type multiplexing: Time division (tdm).
Type modulation: Pulse code (pcm).
No of pcm digits/channel sampling: 6.
Channel interval: TD-352/U...10.4 usec (96 kHz).
Channel bandwidth: 300 to 3,500 Hz.
Line side operation: 4-wire at 50 ohms.
Loop side operation: 4-wire at 600 ohms.
Transmission media: Radio relay (using TD-202/U) or coaxial cable (using TD-204/U).
System range: 240 miles. (Normal planning.)
Video transmit level to TD-202/U or TD-204/U: 2 v peak.
Pulse type:
    From cable or radio combiner:
        48-channel cable: Binary dipulse.
Power req: 109 to 121 v, 47 to 63 Hz.
        TD-352/U: 136 w.

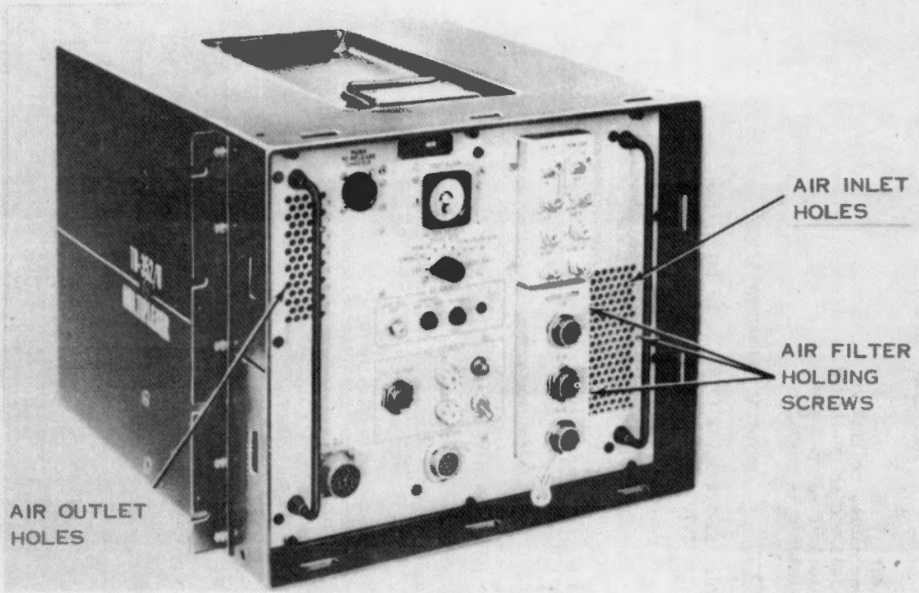
## ANCILLARY ITEMS

Used with:

Power cable, CX-11173/U.
CX-7870/TCC to CV-1548/G.
CG-1040B/U to TD-204/U.
CG-1040B/U to TD-352/U.

## PHYSICAL CHARACTERISTICS

TD-352/U: 13-3/4 (h) x 17 (w) x 20 (d) inches.
2.70 cu ft. 102 lbs.




Multiplexer TD-352/U.

## MULTIPLEXER TD-353/U

STATUS: STD-A; FSN: 5805-985-9153
REF: TM 11-5805-367-12, -35/3

### GENERAL INFORMATION

The TD-353/U converts 48 four-wire voice-frequency channels to a tdm-pcm signal for transmission either over a radio relay system, or over coaxial cable, or over both in tandem. It also reconverts a received tdm-pcm signal to 48 channels. A radio combiner TD-203/U is required with the TD-353/U for operation over radio relay systems. Two TD-353/U's are used with a TD-203/U for a 96-channel capacity radio system. One TD-353/U is used with a TD-204/U to provide a 48-channel capacity cable system.

### TECHNICAL CHARACTERISTICS

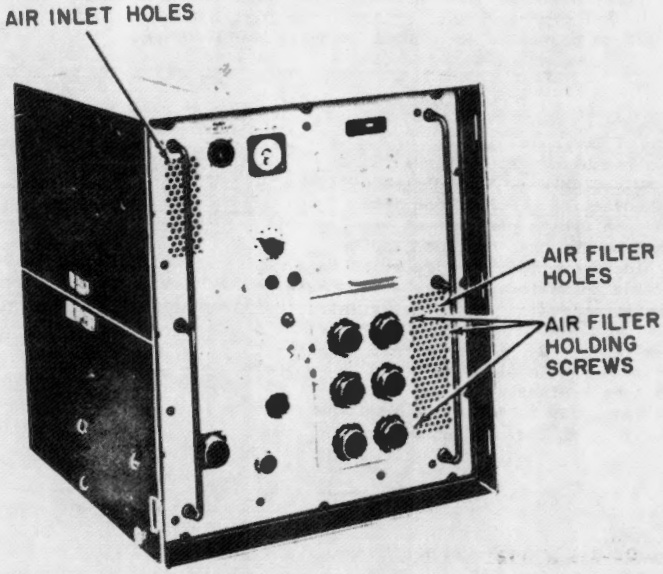
4-wire vf channels: 48.
Channel sampling rate: 8 kHz.
Type multiplexing: time division (tdm).
Type modulation: Pulse code (pcm).
No. of pcm digits per channel sampling: 6.
Channel bandwidth: 300 to 3,500 Hz.
Line side operation: 4-wire at 50 ohms.
Loop side operation: 4-wire at 600 ohms.
Transmission media: Radio relay (with TD-203/U) or coaxial cable (with TD-204/U).
System range: 240 miles (normal planning).
Video transmit level to TD-203/U or TD-204/U: 2 v peak.
Pulse type: Binary.
Power req: 109 to 121 v, 47 to 63 Hz.
TD-353/U: 185 w.

### ANCILLARY ITEMS

Used with:
Power cable, CX-11173/U.
Headset, H-91A/U.
CX-7873/TCC to CV-1548/G.
CG-1040B/U to TD-203/U.
CG-1040B/U to another TD-353/U.

PHYSICAL CHARACTERISTICS

TD-353/U: 19 (h) x 17 (w) x 20 (d) inches
3.79 cu ft. 131 lbs.




**Multiplexer TD-353/U.**

## MULTIPLEXER TD-202/U

STATUS: STD-A; FSN: 5805-884-2176
REF: TM 11-5805-367-12, -35/1.

### GENERAL INFORMATION

The TD-202/U is a 12- or 24- channel pcm-tdm radio transmission interface unit. The transmit section of the TD-202/U accepts the tdm output either from one or two TD-352/U's or a TD-204/U, or from another TD-202/U and processes it for radio transmission. The receive section accepts the pcm output from a radio receiver, processes and retimes it and extracts the order-wire signal. The multiplexer is used at radio terminal, radio repeater, and radio-to-cable conversion locations.

### TECHNICAL CHARACTERISTICS

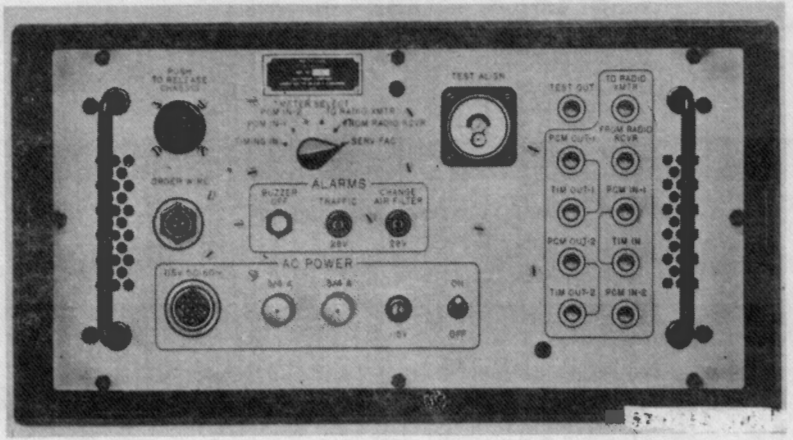
Pulse type: Binary (full width for 12-chan transmit and receive and 24-chan transmit), biternary (full width for 24-chan receive).
Pulse rate: 576 kHz (12-chan).
1.152 mHz (24-chan).
Radio input or output signal: Receive: 0.5 to 3 v.
Transmit: Adjustable from -1 v to -2 v positively to 0 v.
Req radio bandwidth at -3 db point: 12- or 24- chan....240 kHz.
Power req: 109 to 121 v, 47 to 63 Hz, 30 w.

### ANCILLARY ITEMS

Used with:
Power cable, CX-11172/U.
CG-1040B/U-tdm and pcm cable.
CG-409H/U to radio.
CX-7822/TCC - order-wire cable.

### PHYSICAL CHARACTERISTICS

8-1/2 (h) x 17 (w) x 20 (d) inches
1.67 cu ft. 50 lbs.




Multiplexer (Radio Combiner) TD-202/U.

## MULTIPLEXER TD-203/U

STATUS: STD-A; FSN: 5805-884-2177
REF: TM 11-5805-367-12, -35/1

### GENERAL INFORMATION

The TD-203/U is a 48- or 96- chan pcm-tdm radio transmission interface unit. The transmit section of the TD-203/U accepts the tdm either from one or two TD-353/U's, or a TD-204/U, or from another TD-203/U and processes it for radio transmission. The receive section accepts the pcm output from a radio receiver, processes and retimes it and extracts the order-wire signal. The multiplexer is used at radio terminal, radio repeater, and radio-to cable conversion locations.

### TECHNICAL CHARACTERISTICS

Radio input or output signal: Receive: 0.5 to 3 v.
Transmit: Adjustable from -1 v to -2 v positively to 0 v.

Req radio bandwidth at -3 db point:
48- or 96-channel - 935 kHz.

Pulse rate: 2.304 MHz (48-chan).
4.608 MHz (96-chan).

Pulse type: Binary (full width for 48-chan transmit and receive, and 96-chan transmit), biternary (full width for 96-chan receive).

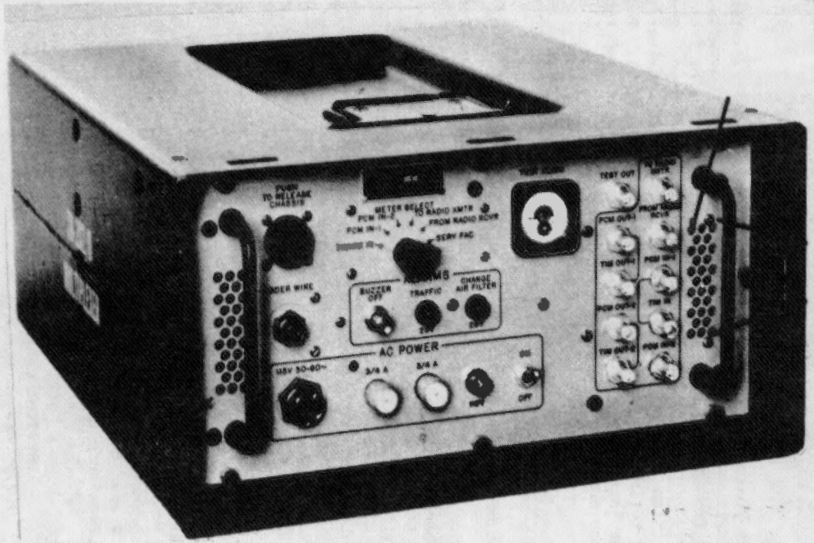
Power req: 109 to 121 v, 47 to 63 Hz, 30 w.

### ANCILLARY ITEMS

Power cable, CX-11173/U.
CG-1040B/U to TD-353/U.
To radio: Order wire - CX-7872/TCC.
Transmitter - CG 498H/U.
Receiver- CG-409H/U.

### PHYSICAL CHARACTERISTICS

8-1/2 (h) x 17 (w) x 20 (d) inches.
1.67 cu ft. 50 lbs.




**Multiplexer (Radio Combiner) TD-203/U.**

## MULTIPLEXER TD-204/U

STATUS: STD-A; FSN: 5805-900-8200
REF: TM 11-5805-367-12, -35/2

### GENERAL INFORMATION

The TD-204/U is a 12-, 24-, and 48-channel cable transmission interface unit. The transmit section of the TD-204/U accepts a tdm-pcm signal from one TD-353/U, one or two TD-352/U's a TD-202/U, a TD-203/U, or from another TD-204/U, also provides power for a maximum of 39 Pulse Form Restorers TD-206/G's, and includes an order-wire facility.

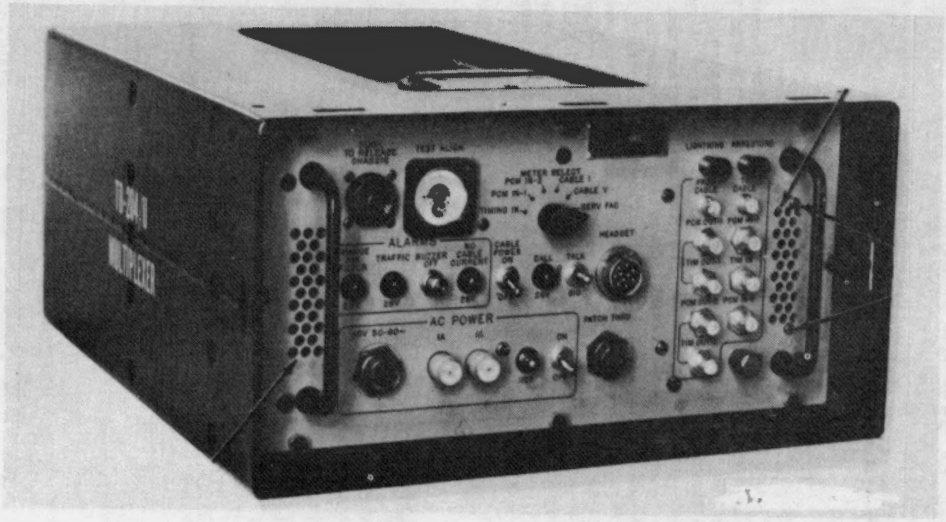
### TECHNICAL CHARACTERISTICS

Pulse type: Binary (full width).
Pulse rate: 12-channel...576 kHz.
24-channel...1,152 MHz.
48-channel...2.304 MHz.
Cable input and output signal:
Impedance: 62 ohms.
Amplitude to cable: 2 volts from 0 to peak.
Amplitude from cable: 30 mv pp nominal.
Type: Binary dipulse.
Bit rate: 2.304 MHz.
Order wire:
Facility: Baseband channel independent of pcm traffic.
Freq response: 300 to 1,700 Hz.
Signaling freq: 1,600 Hz.
Transmit level: 9 v rms min at 880 ohms (at cable transmit amplifier).
Receive level: Adjustable 150 mv rms to 16 v rms across 880 ohms (at cable receive amplifier input).
Power req: 109 to 121 v, 47 to 63 Hz, 62 w.

### ANCILLARY ITEMS

Used with:
Power cable, CX-11173/U.
Headset, H-91A/U.

CX-7874/TCC (patch thru).
CG-2437/TCC- from transmission cable.
CG-2438/TCC- to transmission cable.
CG-1040B/U - to multiplexer.




Multiplexer TD-204/U.

## MULTIPLEXER TD-976(XE-1)/G

STATUS: D; FSN: to be assigned
REF: Draft TM 11-5805-624-12

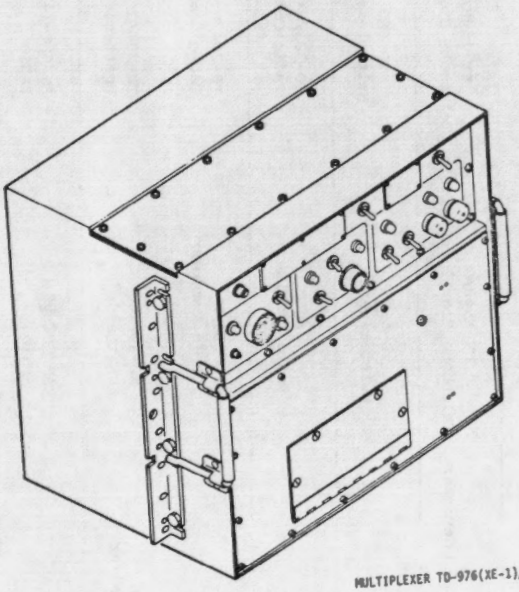
### GENERAL INFORMATION

The TD-976(XE-1)/G is used in video technical control center AN/TSQ-85(XE-1) (developmental) and telephone terminal AN/TCC-73 (developmental) as a data transfer point in a communications network. Its function is to multiplex up to eight groups of pulse code modulation (pcm) into a single super group bit stream and transmit it to another TD-976(XE-1)/G where the bit stream is demultiplexed back to its original groups. Another important function is that of rerouting the demultiplexed groups from one TD-976(XE-1)/G to the group inputs on another TD-976(XE-1)/G within the same AN/TSQ-85(XE-1). The Pulse Form Restorer TD-982(XE-1)/G is used in conjunction with the TD-976(XE-1)/G to eliminate the signal distortion as a result of attendation of the super group bit stream by the cable transmission system.

### TABULATED DATA

Number of pcm groups: 8.
Number of audio channels per pcm group: 6 or 12.
Compatible radio set: AN/GRC-144.
Compatible cable sets: TD-660A/G.
TD-754/G.
TD-204/U.
Compatible cable: CX-11230 or CX-4245/G.
Type of multiplexing: Time division.
Power req: 114 v ac, 47-420 Hz, 115 watts.

Remarks: This item is still in the developmental stages.



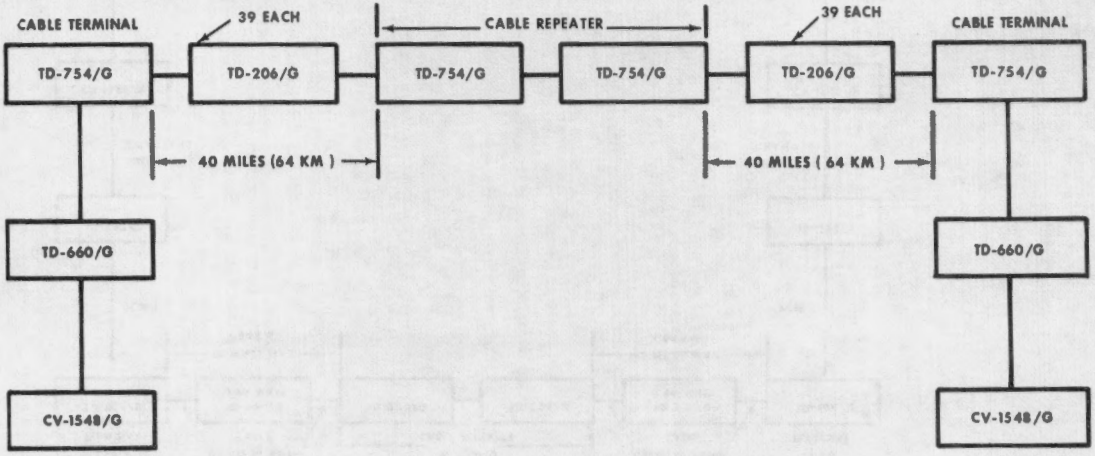
MULTIPLEXER TD-976(XE-1)/G

PULSE CODE MODULATION (PCM) SYSTEM COMPONENTS

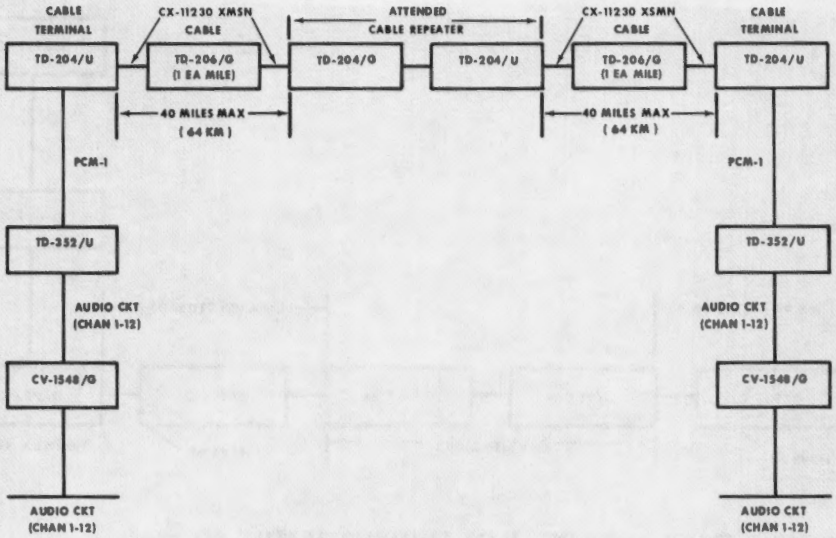
| Low capacity (6-12 channels) | Medium capacity (12-24 channels) | High capacity (48-96 channels) |
|---|---|---|
| CV-1548 Telephone Signal Converter | CV-1548/G Telephone Signal Converter | CV-1548/G Telephone Signal Converter |
| TD-660 Multiplexer | TD-660 Multiplexer | TD-660 Multiplexer |
| (Not required) Radio Combiner | TD-202/U Radio Combiner | TD-203/U* Radio Combiner |
| TD-754/G* Cable Combiner | TD-204/U Cable Combiner | TD-204/U Cable Combiner |
| TD-206/G Unattended Repeater | TD-206/G Unattended Repeater | TD-206/G Unattended Repeater |
| AN/GRC-103 Radio | AN/GRC-50(U) Radio | AN/GRC-147, AN/GRC-144 Radio |

* NOTE: Developmental Stage.

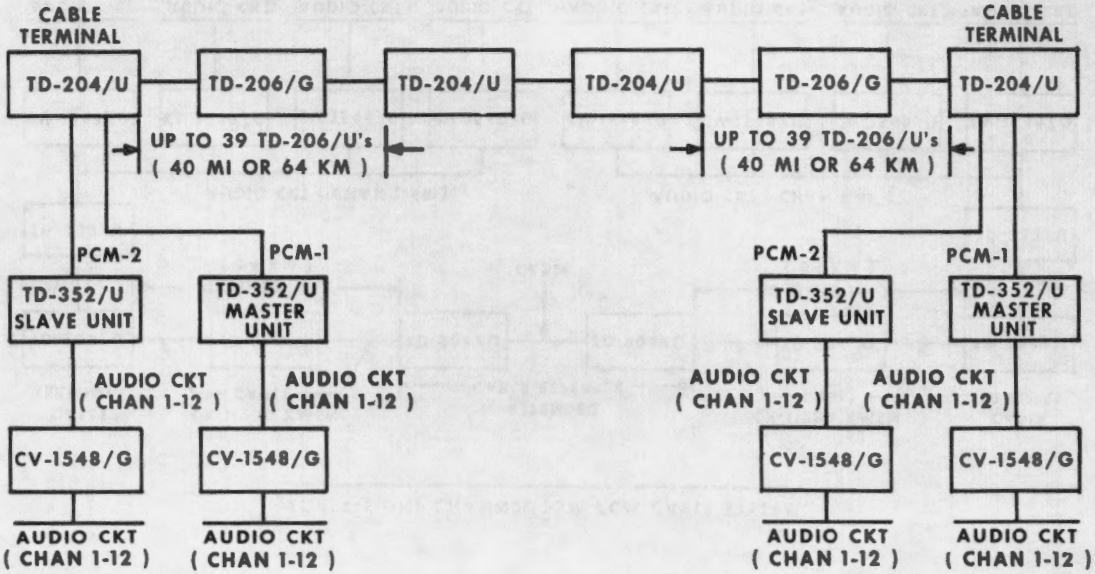
## SIX OR TWELVE CHANNEL LOW CAPACITY CABLE SYSTEM



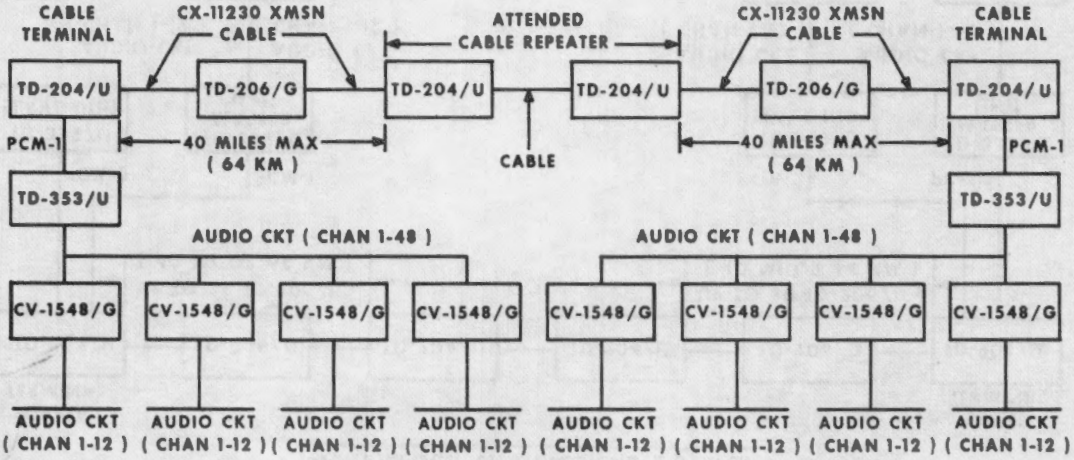
## TWELVE CHANNEL TDM-PCM CABLE SYSTEM



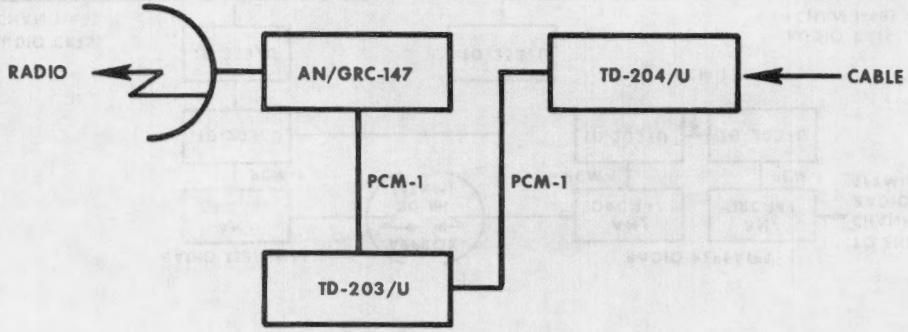
## TWENTY-FOUR CHANNEL CABLE SYSTEM



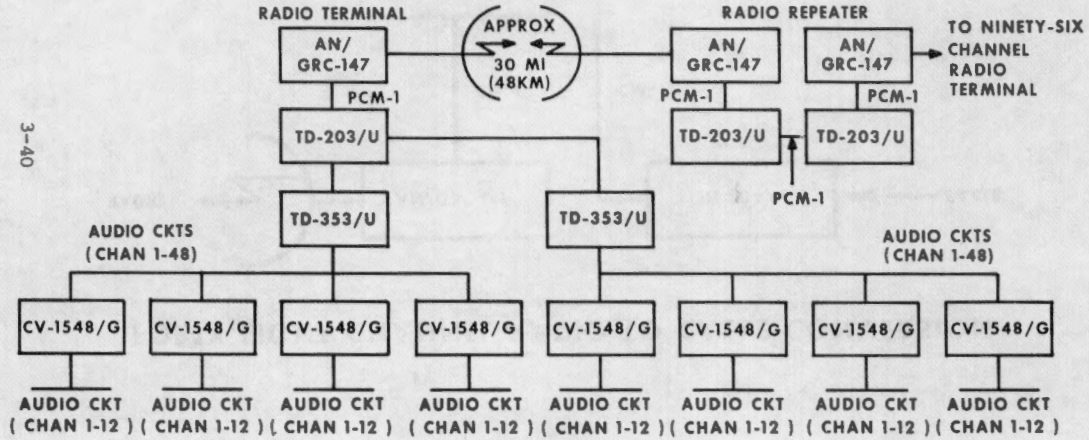
## FORTY-EIGHT CHANNEL TDM-PCM CABLE SYSTEM



## FORTY-EIGHT CHANNEL RADIO TO CABLE CONVERSION



## NINETY-SIX CHANNEL TDM-PCM RADIO SYSTEM



COMPARATIVE GUIDE OF ASSEMBLAGES

| Prior systems | Interim systems | Current systems |
|---|---|---|
| | Low capacity | |
| AN/MRC-69 | AN/MRC-115 | AN/TRC-145 |
| AN/MRC-54; AN/MRC-69 | | AN/TRC-113 |
| AN/MCC-6 | | AN/TCC-65 |
| AN/MRC-69 | | AN/MRC-126 |
| AN/MRC-68; AN/MRC-69 | | AN/MRC-127 |
| | Medium capacity | |
| AN/MCC-6; AN/MRC-69 | AN/TCC-60 | AN/TCC-69 |
| AN/MCC-6 | | AN/TCC-61 |
| AN/MRC-73 | AN/TRC-108 | AN/TRC-143 |
| AN/MRC-54 | | AN/TRC-109 |
| AN/MRC-54 | AN/MRC-103 | AN/TRC-110 |
| AN/MRC-73 | AN/MRC-102 | AN/TRC-117 |
| | High capacity | |
| AN/MCC-6 | | AN/TCC-62 |
| AN/MCC-6 | | AN/TCC-65 |
| AN/MCC-6 | | AN/TCC-72 |
| AN/MRC-54 | AN/TRC-111 | AN/TRC-138 |
| AN/MRC-73 | | AN/TRC-151 |
| AN/MRC-54 | | AN/TRC-152 |
| | Tropo | |
| AN/MRC-54; AN/MRC-73 | AN/TRC-97A | AN/TRC-112 |
| AN/MRC-54 | | AN/TRC-121 |

**NOTE: Replacements indicated are not necessarily on a one-for-one basis.**

## RADIO SETS EMPLOYED IN LOW, MEDIUM, AND HIGH CAPACITY SYSTEMS

| Nomenclature | Freq range per band (MHz) | Power output (watts) | Trans range (miles) | Max pwr consump (watts) | Modulation | No. of chan | Trans Vac tubes (T) (VT) | No. of trans | No. of rcvrs | No. of pwr sup | No. of volt reg | Weight[a] (lbs) | Volume[a] (cu ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/GRC-50(V)$_1$ | 601.5- 999.5<br>1350.5-1849.5 | 10-20 | 30 | 1,100 | FM | 899 | VT | 1 | 1 | 1 | 1 | 466 | 18.75 |
| AN/GRC-50(V)$_2$ | 1350.5-1849.5 | 10 | 30 | 2,200 | FM | 500 | VT | 2 | 2 | 2 | 1 | 810 | 23.0 |
| AN/GRC-50(V)$_3$ | 601.5- 999.5 | 20 | 30 | 2,200 | FM | 399 | VT | 2 | 2 | 2 | 1 | 810 | 23.0 |
| AN/GRC-50(V)$_4$ | 1350.5-1849.5 | 10 | 30 | 3,300 | FM | 500 | VT | 3 | 3 | 3 | 1 | 1215 | 34.5 |
| AN/GRC-50(V)$_5$ | 601.5- 999.5 | 20 | 30 | 3,300 | FM | 399 | VT | 3 | 3 | 3 | 1 | 1215 | 34.5 |
| AN/GRC-50(V)$_6$ | 601.5- 999.5<br>1350.5-1849.5 | 10-20 | 30 | 2,200 | FM | 899 | VT | 2 | 2 | 2 | 1 | 810 | 23.0 |
| AN/GRC-50(V)$_7$ | 601.5- 999.5<br>1350.5-1849.5 | 10-20 | 30 | 3,300 | FM | 899 | VT | 3 | 3 | 3 | 1 | 1215 | 34.5 |
| AN/GRC-50(V)$_8$ | 601.5- 999.5<br>1350.5-1849.5 | 10-20 | 30 | 1,100 | FM | 899 | VT | 1 | 1 | 1 | 1 | 466 | 18.75 |
| AN/GRC-67 | 4400 -5000 | 0.5-2.0 | 30 | 850 | FM | 120 | VT | 1 | 1 | 2 | - | 330 | 13.28 |
| AN/GRC-68 | 4400 -5000 | 0.5-2.0 | 30 | 1,700 | FM | 120 | VT | 2 | 2 | 4 | - | 660 | 26.56 |
| AN/GRC-147 | 4400 -5000 | 0.5-2.0 | 30 | 2,550 | FM | 120 | VT | 3 | 3 | 6 | - | 1980 | 39.84 |
| AN/GRC-103(V)$_0$<br>(V)$_1$<br>(V)$_2$<br>(V)$_3$ | 76 - 170<br>220 - 404.5<br>394.5- 705<br>695 -1000 | 15-25 | 20 | 300 | FM | 1,560 | T | 1 | 1 | 1 | - | 150 | 2.48 |
| AN/GRC-106 | 2 - 30 | 200-400 | 50 | 800 (est) | SSB AM FSK | 28,000 | T | 1 | 1 | - | - | 114 | 2.17 |
| AN/GRC-143 | 4400 -5000 | 1,000 | 100 | 6,000 (est) | FM | 6,000 | T | 1 | 1 | - | - | 700 | 10.0 |
| AN/GRC-144 | 4400 -5000 | 0.25 | 30 | 750 | FM | 6,000 | T | 1 | 1 | - | - | 200 | 4.4 |

[a]Radio Only

CHAPTER 4

GROUND MOBILE EQUIPMENT

CONTENTS

CONTENTS PAGE

## Section I. GENERAL

### INTRODUCTION

To provide the communications equipment to meet the requirements of a field army communications system, the United States Army has developed ground mobile equipment (shelter-mounted communication assemblages) for use at each signal center within a field army. Ground mobile equipment are provided with a variety of sets and components including radio relay, multiplexing equipment, telephone and teletypewriter central offices, and other items required for signal center facilities within a field army, primarily from brigade to army rear. However, when used in appropriate combinations and quantities, the ground mobile equipment will meet the common user, sole user, and special purpose needs of all field organizations through theater level.

### SHELTERS AND VANS

The shelters and vans used in ground mobile configurations are air- or vehicular-transportable; they are made of aluminum and are lightweight and weatherproof. All required COMMEL equipment, racks, frames, outlets, ducts, furniture, heating, air-conditioning, housekeeping and similar items are "built-in" to a shelter during its fabrication for a using organization. The following chart gives the nomenclature, type classification, dimensions, weight and prime mover of ground mobile equipment shelters and vans.

All shelters are finished with a green enamel solar reflecting paint (FSN: 8010-985-7258) which reduces the temperature on the shelter surface by as much as 35 degrees. The undercoat is a white lusterless enamel (FSN: 8010-297-2111). A finish coat of the green enamel is applied on this white lusterless enamel.

# SHELTERS AND VANS

| TYPE NUMBER | STDZN STATUS | OUTSIDE DEMENSIONS (IN) | | | WEIGHT | PRIME MOVER |
|---|---|---|---|---|---|---|
| | | LENGTH | WIDTH | HEIGHT | | |
| S-144A/G | A | 76 | 57 | 62½ | 380 | ¾TON TRK M-37 OR XM -715 |
| S-318/G | A | 75⅞ | 72 | 70⅞ | 400 | ¾TON TRK M-37 OR XM-715 |
| S-141/G | B | 142 | 81 | 82 | 1,100 | 2½TON TRK M-35 OR M-211 |
| S-280/G | A | 146 | 87 | 83 | 1,200 | 2½TON TRK M-35 OR M-211 |
| S-250/G | A | 84¾ | 79 | 70 | 630 | 1¼TON TRK M-561 OR M-705 |
| M348A2 | A | 324 | 96 | 131 | 8,650 | 2½TON TRACTOR M275A2 |

## SHELTER NOMENCLATURE

Bare shelters are modified and equipped with facilities for the installation of communications components that are required for specific assemblages. The shelter facility nomenclature is Shelter, "Electrical Equipment" followed by the type number; for example, S-179/MTA-3. The use of the term "modified S-141/G" following the nomenclature is for information purposes to identify the bare shelter prior to its modification and is not part of the nomenclature. When all of the communications components are installed in the S-179/MTA-3, it becomes an assemblage. Then its nomenclature is AN/MTA-3, Telephone Switchboard Group.

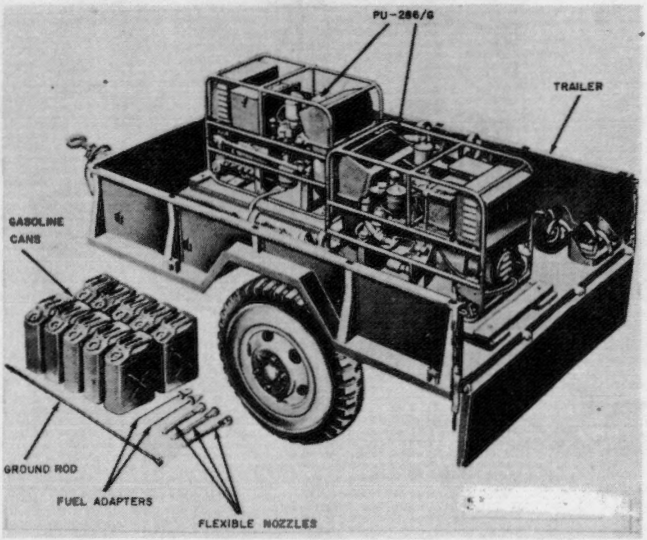
## POWER GENERATING EQUIPMENT

The power units and transporting equipment listed in the following chart are Mobility Command (MOCOM) items which are used with, but not part of ground mobile configurations. The PU-294/U, PU-322/G and PU-474/M are described and illustrated in the following pages.

## GENERATOR SET, GASOLINE ENGINE, TRAILER-MOUNTED PU-294/G

### GENERAL INFORMATION

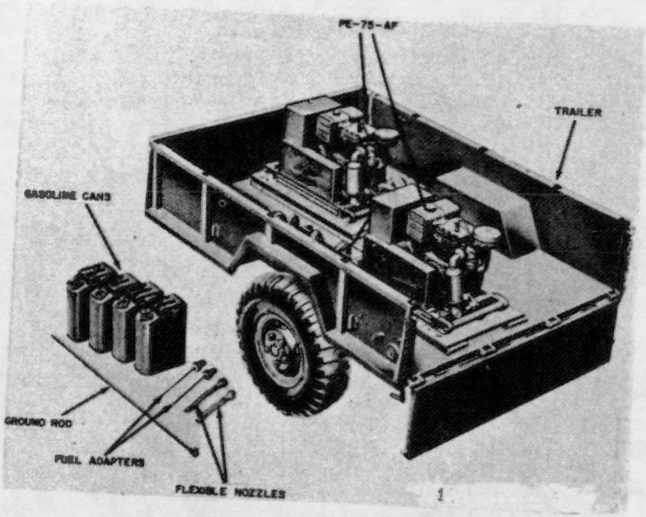
The PU-294/G includes a standard 1-1/2-ton 2-wheel cargo trailer (M-104 or M-105) on which two Generator Sets, Gasoline-Engine PU-286/G are mounted. Other components as shown are stored in the trailer. Gasoline-can storage brackets are also provided. The PU-294/G supplies 115-volt, 50- to 60 Hertz, 5,000 watt, 52-ampere alternating current when either PU-286/G is operating at full load. A switch box (not shown) is provided for switching from one PU-286/G to the other, without power interruption. The PU-294/G weighs 4,400 pounds.



GENERATOR SET, GASOLINE-ENGINE
TRAILER-MOUNTED PU-322/G

GENERAL INFORMATION

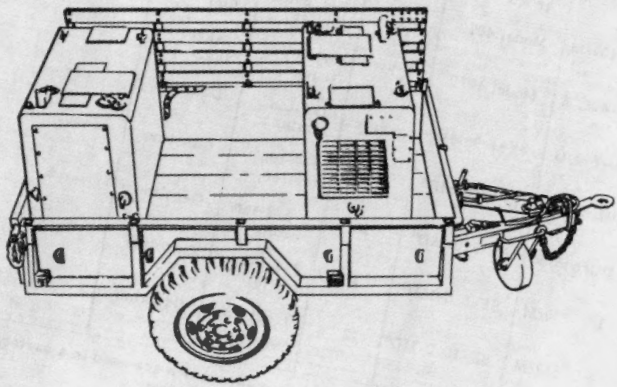
The PU-322/G includes a standard 3/4-ton, 2-wheel cargo trailer (M-101) on which two Generator Sets, Gasoline Engine PE-75AF are mounted. Other components, as shown, are stored in the trailer. The PU-322/G supplies 115-volt, 50- to 60-Hertz, 2,500-watt, 22-ampere alternating current when either PE-75AF is operating at full load. A switch box (not shown) is provided for switching from one PE-75AF to the other, without power interruption. The PU-322/G weights 2,350 pounds.



## GENERATOR SET, GASOLINE ENGINE, TRAILER-MOUNTED PU-474/M

### GENERAL INFORMATION

The PU-474/M includes a standard 1-1/2 ton, 2-wheel cargo trailer (M-105A1) on which two 10 kw power units are mounted. The PU-474/M supplies 115 volts, single- or 3-phase, 50- to 60-Hertz alternating current.



POWER GENERATING EQUIPMENT

| Generator set | Power unit | Number of units | Vehicle | Type of fuel | Full load consumption (Gal per Hr) |
|---|---|---|---|---|---|
| PU-322/G | PE-75-AF | 2 | 3/4-ton trailer | Gasoline | 2/3 |
| PU-294/G | PU-286/G | 2 | 1-1/2-ton trailer | Gasoline | 1.5 |
| PU-456/G | PU-286/G | 2 | 3/4-ton trailer | Gasoline | 1.5 |
| PU-474/M | Water cooled 10 KW | 2 | 1-1/2-ton trailer | Gasoline | 3.22 |
| PU-407/M | Model 4070 | 1 | 2-1/2-ton trailer | Diesel fuel | 3.38 |
| PU-408/M | Model 4070 | 1 | 5-ton truck | Diesel fuel | 3.38 |
| PU-623/G | SF-1.5-MD[a] | 2 | 1/4-ton trailer | Gasoline | --- |
| PU-617/M | SF-3.0-MD[a] | 2 | 3/4-ton trailer | Gasoline | --- |
| PU-618/M | SF-5.0-MD[a] | 2 | 1-1/2-ton trailer | Gasoline | 1.5 |
| PU-620/M | SF-5.0-MD[a] | 2 | 3/4-ton trailer | Gasoline | 1.5 |
| PU-619/M | SF-10.0-MD[a] | 2 | 1-1/2-ton trailer | Gasoline | 3.2 |

[a]The military standard air-cooled engine generators are used in a variety of other configurations. Some of these are listed below:

SF-3.0-MD: PU-625/G, PU-626/TRC-108, PU-628/G.

SF-5.0-MD: PU-629/G, PU-631/G, PU-409A/M, PU-236B/G.

SF-10.0-MD: PU-332A/G, PU-564A/G.

POWER OUTPUT AND RATING

| KW | PF | KVA | Freq (Hz) | Phase | Current (amps) | Voltage |
|---|---|---|---|---|---|---|
| 2.5 | 1 | 2.5 | 60 | 1 | 22.5 | 120 |
| 5 | 0.8 | 6.25 | 60 | 1 | 52 | 120 |
| 5 | 0.8 | 6.25 | 60 | 1 | 52 | 120 |
| 10 | 0.8 | 12.5 | 60 | 1<br>or<br>3 | 104-1 Ph<br>34.7 per phase-3 Ph | 120-1 Ph<br>120-3 Ph<br>120/208-3 Ph |
| 45[a] | 0.8 | 56.25 | 50/60[a] | 3 | 156 per phase | 120/208 |
| 45[a] | 0.8 | 56.25 | 50/60[a] | 3 | 156 per phase | 120/208 |
| 1.5 | 0.8 | 1.87 | 60 | 1 | 15.6 | 120 |
| 3 | 0.8 | 3.75 | 60 | 1 | 31.25 | 120 |
| 5 | 0.8 | 6.25 | 60 | 1 | 52 | 120 |
| 5 | 0.8 | 6.25 | 60 | 1 | 52 | 120 |
| 10 | 0.8 | 12.5 | 60 | 1<br>or<br>3 | 104-1 Ph<br>34.7 per phase-3 Ph | 120-1 Ph<br>120-3 Ph<br>120/208-3 Ph |

[a]Power output reduced to 37.5 KW at 50 Hz.

## Section II. DISTRIBUTION BOXES AND CABLE ASSEMBLIES

Note: The distribution boxes and cable assemblies described below are issued with ground mobile equipment, as required. The maximum current carrying capacity of the power cables is 60 amperes and is limited by the capacity of the connectors.

Distribution Box J-2317/U. The J-2317/U is used as an intermediate distributing frame (IDF) to reduce the number of patch cords needed on a patching panel, or the number of cross connects needed on a main distributing frame (MDF). It can also be used to consolidate three partially filled 26-pair cables into one completely filled cable to reduce the number of unusable jacks on a patching panel. The distribution box consists of four 26-pair cable connectors and 105 push-type binding posts. A hinged cover lifts up and locks open for access to the binding posts.

Distribution Box J-1077A/U. The J-1077A/U is a drop line box which is used to connect field wire pairs into a 26-pair cable. It contains 26 pairs of binding posts and two 26-pair cable receptacles. The binding posts are under the hinged front cover. The two 26-pair receptacles are mounted at the sides. A wire-entry slot on each side permits the cover to be closed after the field wire is connected to the binding posts. Pairs 1 through 26 of one 26-pair receptacle are wired to the corresponding binding posts and to pairs 1 through 26 of the other 26-pair receptacle. The J-1077A/U is used primarily to distribute local telephone circuits within a signal center, and to consolidate circuits into a 26-pair cable when binding posts are not available on a shelter.

Cable Assembly, Telephone CX-4566/U (250 Ft). The CX-4566/U (250 ft) is a 26-pair cable used to interconnect the components in an area-type communications system. It is also used to connect drop line boxes (J-1077/U's) to a shelter for dropping lines, or field wire connections. Each end of the 26-pair cable terminated in a waterproof 26-pair connector with a waterproof cover.

Cable Assembly, Telephone CX-4566/U (25 Ft). The CX-4566/U (25 ft) is identical with Telephone Cable Assembly CX-4566/U (250 ft) except for its length. It is used where a shorter span of 26-pair cable can be used.

Cable Assembly, Power, Electrical CX-4694A/U (100 Ft). The CX-4694A/U is a flat, three-conductor power cable used to connect the output of power generating equipment to a shelter. It has a waterproof, three-terminal male connector (w/cover) at one end and a waterproof, female connector (w/cover) at the other end. Two CX-4694A/U's cannot be interconnected, except through Connector Adapter UG-1312/U. Conductors in the CX-4694A/U are two 6-gauge (power) and one 12-gauge (ground).

Note: The CX-4694 is the same as the CX-4694A/U except that the conductors are two 8-gauge (power) and one 12-gauge (ground).

Cable Assembly, Power, Electrical CX-4693/U (25 Ft). The CX-4693/U is a flat, three-conductor power stub used to connect the output of individual power generators to a switch box. The CX-4693/U can also be used to connect a commercial power source directly to the shelter. Connector Adapter UG-1312/U must be used to interconnect the CX-4693/U to another power cable (CX-4694A/U). The CX-4693/U terminates in a waterproof, three-terminal female connector (w/cover) at one end, and three spade lugs at the other end.

Cable Assembly, Power, Electrical CX-7453/U (100 Ft). The CX-7453/U has 8 pin connectors (hermaphrodite) on each end and contains two 6-gauge power conductors and one 8-gauge ground conductor. It is suitable for single-phase generators or for individual phases of multi-phase units.

Cable Assembly, Power, Electrical CX-7705/U (15 Ft). The CX-7705/U is a power cable stub used with the CX-7453/U.

Cable Assembly CX-11215/G (3 Ft). The CX-11215/G has a 3-pin connector on one end and an 8-pin connector on the other. The conductors in the CX-11215A/G are two 6-gauge (power) and one 8-gauge (ground). The CX-11215/G functions as an adapter to convert a 3-pin system to an 8-pin system.

Connector Adapter UG-1312/U. The UG-1312/U, also called a junction box, is required to interconnect two power cables or a power cable and a power stub. It consists of a three-conductor male connector (w/cover) on one end, and a three-conductor female connector (w/cover) on the other end. The sleeve of the power cable connector, when connected, is screwed to the UG-1312/U and provides a waterproof connection.

Voltage Drop Per 100 Feet for the CX-4694/U

| Load in amperes | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| Voltage drop | 1.3 | 2.6 | 3.9 | 5.2 | 6.5 | 7.8 | 9.1 | X | X | X |

Voltage Drop Per 100 Feet for the CX-7453/U and CX-4694A/U

| Load in amperes | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| Voltage drop | .84 | 1.7 | 2.5 | 3.5 | 4.2 | 5.0 | 5.9 | X | X | X |

## Section III. TELEPHONE SWITCHING AND PATCHING EQUIPMENT

### CENTRAL OFFICE, TELEPHONE MANUAL AN/MTC-1, and 1A

STATUS: STD-A; FSN: 5805-167-7628 (AN/MTC-1A)
STD-B; FSN: 5805-926-0255 (AN/MTC-1)
REF: TM 11-5805-284-15

### GENERAL INFORMATION

The AN/MTC-1 is a manual telephone switching facility which provides terminations for local or common battery subscriber circuits, and for manual or dial trunks. The AN/MTC-1 consists of two configurations: telephone switchboard group AN/MTA-3, and telephone connecting and switching group AN/MTA-4. The MTA-3 contains three switchboard, telephone, manual SB-249A/TTC positions, cabled in a two panel multiple arrangement. The MTA-4 contains relays, main distribution frames, storage batteries, and a power panel required to complete the switchboard equipment. The relays in the AN/MTA-4 provide for terminating 200 local or common battery subscriber circuits and 20 manual or dial trunks. The AN/MTC-1 also includes facilities for an information operator, chief operator and wire chief. Major components of the AN/MTC-1 are:

AN/MTA-3

1 ea elec equip shelter S-179/MTA-3 (modified S-141/G).
3 ea Switchboard, Telephone, Manual SB-249A/TTC.
3 ea Telephone Set TA-312/PT.
1 ea Test Set, Telephone TS-1361/G.
1 ea Intercommunication Set LS-147/FI.
1 ea Terminal Box TA-125/GT.

AN/MTA-4

1 ea Electrical Equipment Shelter S-180/MTA-4 (modified S-141/G).
3 ea Main Distribution Frame, Telephone TA-257/TTC.
2 ea Telephone Circuit Line Relay TA-223A/TTC.
1 ea Tel Circuit Trunk Relay TA-226A/TTC.
1 ea Panel, Power Distribution SB-1032/TTC.
4 ea Battery (wet cell) BB-46.
3 ea Telephone Set TA-312/PT.
2 ea Intercommunication Set LS-147/FI.
1 ea Terminal Box TA-125/GT.
Weight: AN/MTA-3: 4,490 lbs.

Weight: AN/MTA-4: 4,339 lbs.
Power consumption: AN/MTA-3: 3,522 watts.
AN/MTA-4: 4,234 watts.

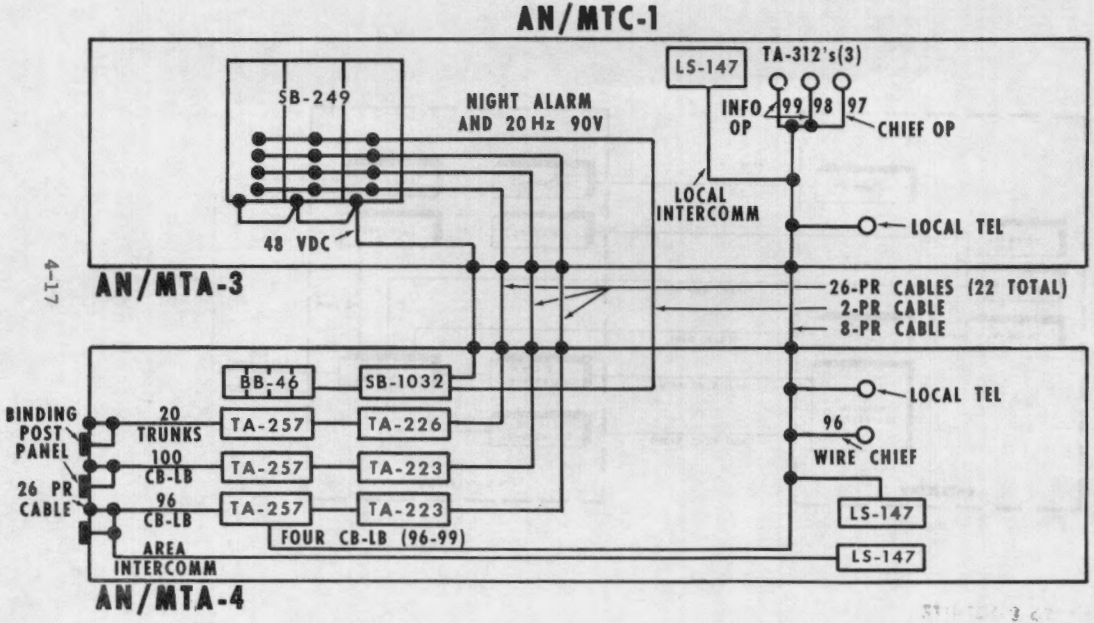
MOCOM items:

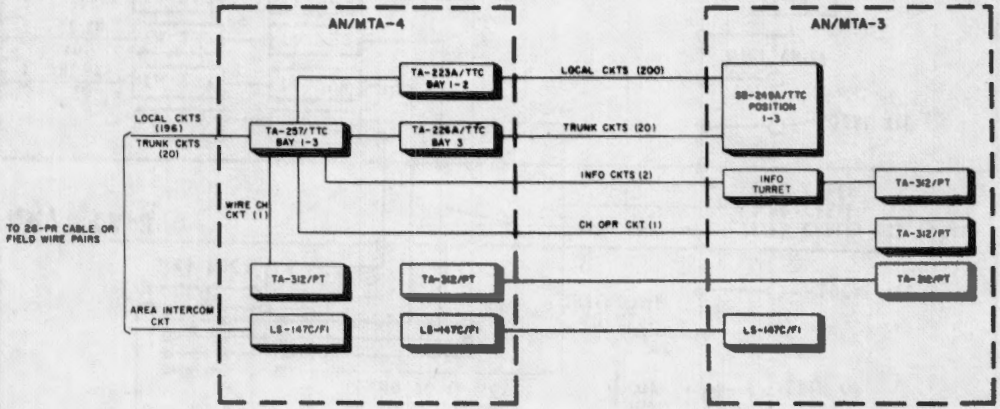
2 each Truck, Cargo 2-1/2-ton M-35 or M-211.
1 each Generator Set, Gas Eng, Tlr Mtd PU-474/M.

Remarks:

The AN/MTA-3 and AN/MTA-4 are being replaced by the AN/MTA-3A and AN/MTA-4A in which components of Telephone Central Office Group, Manual AN/GTA-14 (instead of the AN/TTC-7) are used.

The AN/MTC-1A is being developed in which the AN/MTA-3B and AN/MTA-4B use the new S-280/G shelter (modified to S-365/MTA-3B and S-366/MTA-4B).


AN/MTC-1
LS-147
TA-312's(3)
SB-249
NIGHT ALARM
AND 20 Hz 90V
INFO OP
99
98
97
CHIEF OP
LOCAL INTERCOMM
LOCAL TEL
48 VDC
AN/MTA-3
26-PR CABLES (22 TOTAL)
2-PR CABLE
8-PR CABLE
BB-46
SB-1032
LOCAL TEL
BINDING POST PANEL
20 TRUNKS
TA-257
TA-226
96
WIRE CHIEF
100 CB-LB
TA-257
TA-223
26 PR CABLE
96 CB-LB
TA-257
TA-223
LS-147
FOUR CB-LB (96-99)
AREA INTERCOMM
LS-147
AN/MTA-4


AN/MTA-4
AN/MTA-3
TA-223A/TTC BAY 1-2
LOCAL CKTS (200)
SB-3418A/TTC POSITION 1-3
LOCAL CKTS (196)
TRUNK CKTS (20)
TA-257/TTC BAY 1-3
TA-226A/TTC BAY 3
TRUNK CKTS (20)
INFO CKTS (2)
INFO TURRET
TA-312/PT
WIRE CH CKT (1)
CH OPR CKT (1)
TA-312/PT
TO 26-PR CABLE OR FIELD WIRE PAIRS
TA-312/PT
TA-312/PT
TA-312/PT
AREA INTERCOM CKT
LS-147C/FI
LS-147C/FI
LS-147C/FI

CENTRAL OFFICE, TELEPHONE MANUAL
AN/MTC-3

STATUS: STD-B; FSN: 5805-941-0873
REF: TM 11-5805-202-15

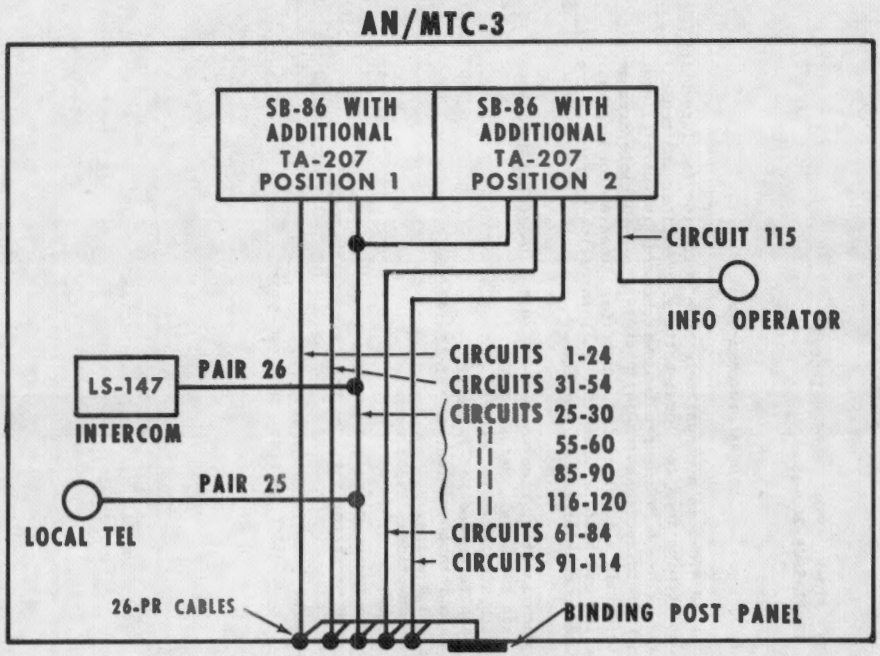
GENERAL INFORMATION

The AN/MTC-3 is a manual telephone switching facility which provides terminations for local-battery subscriber and trunk circuits. The AN/MTC-3 uses two switchboards (SB-86/P's) plus two jack field sections (TA-207/P's) in a non-multiple arrangement to obtain a total of 120 subscriber lines and/or trunks. Facilities are also provided for an information operator. The major components of the AN/MTC-3 are:

1 each Shelter, Elec Equip S-175/MTC-3 (modified S-141/G).
2 each Swbd, Tel, Manual SB-86/P.
2 each Sig Assembly, Swbd TA-207/P.
2 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.

Weight: 3,398 lbs.
Power consumption: 3,383 watts.
MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.
1 each Generator Set, Gas Eng, Tir Mtd PU-294/G.

Remarks: Replaced by AN/TTC-23
(STD-A; FSN: 5805-930-9303).


AN/MTC-3
SB-86 WITH ADDITIONAL TA-207 POSITION 1
SB-86 WITH ADDITIONAL TA-207 POSITION 2
CIRCUIT 115
INFO OPERATOR
LS-147
INTERCOM
PAIR 26
PAIR 25
LOCAL TEL
CIRCUITS 1-24
CIRCUITS 31-54
CIRCUITS 25-30
" 55-60
" 85-90
" 116-120
CIRCUITS 61-84
CIRCUITS 91-114
26-PR CABLES
BINDING POST PANEL

TO LOCAL OR TRUNK CIRCUITS
SIGNAL & POWER ENTRANCE BOX
TELEPHONE SET
JACK AND BINDING POST PANEL
INTERCOM
SIGNAL BINDING POSTS BOX
TO LOCAL CIRCUITS
TELEPHONE SET
JACK PANEL
TO POSITION NO 2
POWER PACK
KEY SHELF SECTION
JACK FIELD SECTION NO 1
JACK FIELD SECTION NO 2
POSITION NO 1
FROM SIGNAL BINDING POSTS BOX
POWER PACK
KEY SHELF SECTION
JACK FIELD SECTION NO 1
JACK FIELD SECTION NO 2
POSITION NO 2

## CENTRAL OFFICE, TELEPHONE, MANUAL AN/MTC-7

STATUS: STD-B; FSN: 5805-941-0795
REF: TM 11-5805-211-15

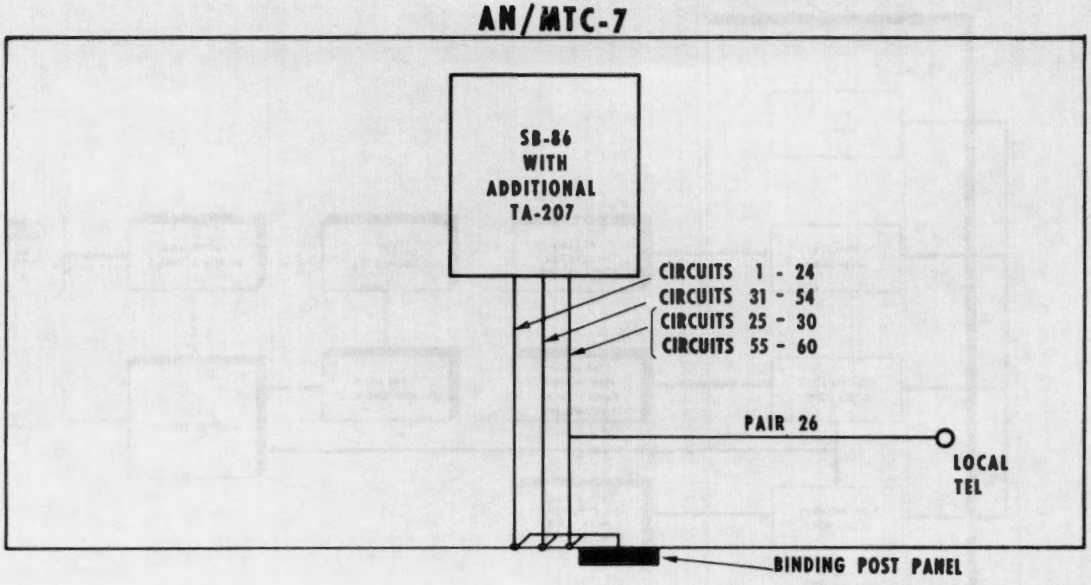
### GENERAL INFORMATION

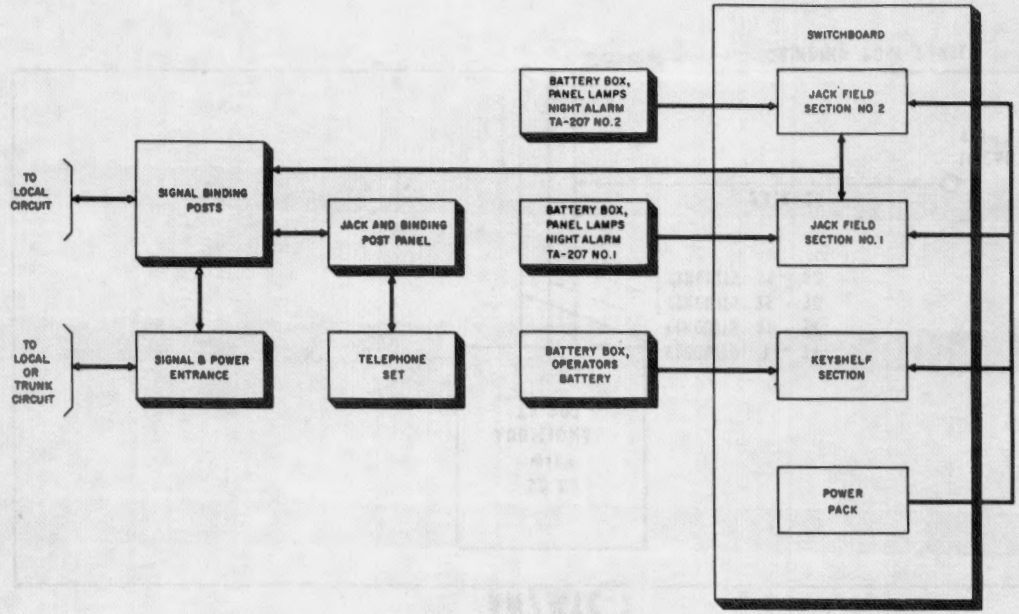
The AN/MTC-7 is a manual telephone switching facility which provides terminations for local-battery subscribers and trunk circuits. One switchboard (SB-86/P) plus one jack field section (TA-207/P) are used to obtain a total of 60 subscriber lines and/or trunks. The major components are:

1 each Shelter, Elec Equip S-170/MTC-7 (modified S-144/G).
1 each Swbd, Tel, Manual SB-86/P.
1 each Signal Assy, Swbd TA-207/P.
1 each Telephone Set TA-312/PT.

Weight: 1,410 lbs.
Power consumption: 1,883 watts.
Power provided: 1 ea Generator Set, Gas Engine, Tlr Mounted PU-322/G.

Remarks: Replaced by the AN/TCC-29 (STD-A; FSN: 5805-935-8082).


AN/MTC-7
SB-86
WITH
ADDITIONAL
TA-207
CIRCUITS 1 - 24
CIRCUITS 31 - 54
CIRCUITS 25 - 30
CIRCUITS 55 - 60
PAIR 26
LOCAL
TEL
BINDING POST PANEL


SWITCHBOARD
BATTERY BOX, PANEL LAMPS NIGHT ALARM TA-207 NO.2
JACK FIELD SECTION NO 2
TO LOCAL CIRCUIT
SIGNAL BINDING POSTS
JACK AND BINDING POST PANEL
BATTERY BOX, PANEL LAMPS NIGHT ALARM TA-207 NO.1
JACK FIELD SECTION NO. 1
TO LOCAL OR TRUNK CIRCUIT
SIGNAL & POWER ENTRANCE
TELEPHONE SET
BATTERY BOX, OPERATORS BATTERY
KEYSHELF SECTION
POWER PACK

## CENTRAL OFFICE, TELEPHONE, MANUAL AN/TTC-29

STATUS: STD-A; FSN: 5805-935-8082
REF: TM 11-5805-582-14

### GENERAL INFORMATION

The AN/TTC-29 is an air or vehicular transportable assemblage used to provide non-secure switchboard facilities. The AN/TTC-29 is primarily a local-battery, central office switchboard that can connect up to 60 lines. Each line circuit operates as a magneto signaling line or a common battery signaling line. Facilities for connecting field wire or 26 pair cable exists.

### TECHNICAL CHARACTERISTICS

Capabilities: 60 two-wire lines.
Signaling: Magneto or common battery.
Power requirements: 115 v, 50-60 Hertz single phase.
Common battery signaling: 5 batteries BA-200/U.
Operators telephone: 2 batteries BA-30.
Night alarm AN panel lamps: 4 batteries BA-30.
Major components:

- 1 ea Switchboard SB-248.
- 2 ea Switchboard Sig Assembly TA-207/P.
- 1 ea Power Supply PP-990/G.
- 2 ea Distribution Box J-1077A/U.

## CENTRAL OFFICE, TELEPHONE, MANUAL AN/MTC-9

STATUS: STD-A; PSN: 5805-831-6063
REF: TM 11-5805-288-15

### GENERAL INFORMATION

The AN/MTC-9 is a manual telephone switching facility which provides terminations for local- or common-battery subscriber circuits and manual or dial trunks. It includes an AN/MTA-7 and an AN/MTA-5 (see components below). The AN/MTA-7 contains nine switchboard positions (SB-249A/TTC's) cabled in a four-panel multiple arrangement. The AN/MTA-5 includes the relays, main distribution frames, storage batteries, and power panels required for the switchboard equipment. The relay equipment in the AN/MTA-5 provide for termination of 600 local- or common-battery subscriber circuits, and 60 manual or dial trunks. Facilities are also provided for an information operator, chief operator and wire chief. The major components of the AN/MTC-9 are:

#### TELEPHONE SWITCHBOARD GROUP AN/MTA-7

1 each Semi-Trailer, Van Eltr Equip V-316/MTA-7 (modified M-348A2).
9 each Swbd, Tel Manual SB-249A/TTC.
4 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.
1 each Test Set, Telephone TS-1361/G.
12 each Distribution Box J-1077/U.

#### TELEPHONE TERMINAL GROUP AN/MTA-5

1 each Semi-Trailer Van Eltr Equip V-315/MTA-5 (modified M-348A2).
7 each Tel, Main Distr Frame TA-257/TTC.
6 each Tel Circuit Line Relay TA-223A/TTC.
3 each Tel Circuit Trunk Relay TA-226A/TTC.
2 each Power Distribution Panel SB-1032/TTC.
4 each Telephone Set TA-312/PT.
2 each Intercommunications Set LS-147/FI.
4 each Battery (wet cell) BB-46.

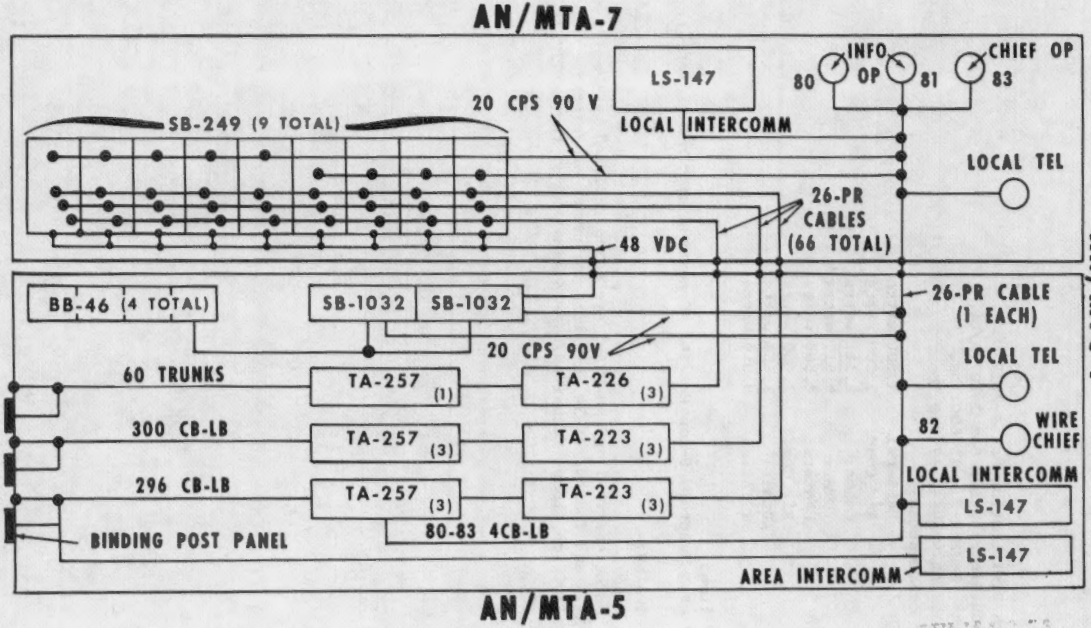
3 each Distribution Box J-2317/U.
15 each Distribution Box J-1077A/U.
Weight: AN/MTA-7: 19,600 lbs.
AN/MTA-5: 17,940 lbs.
Power consumption:

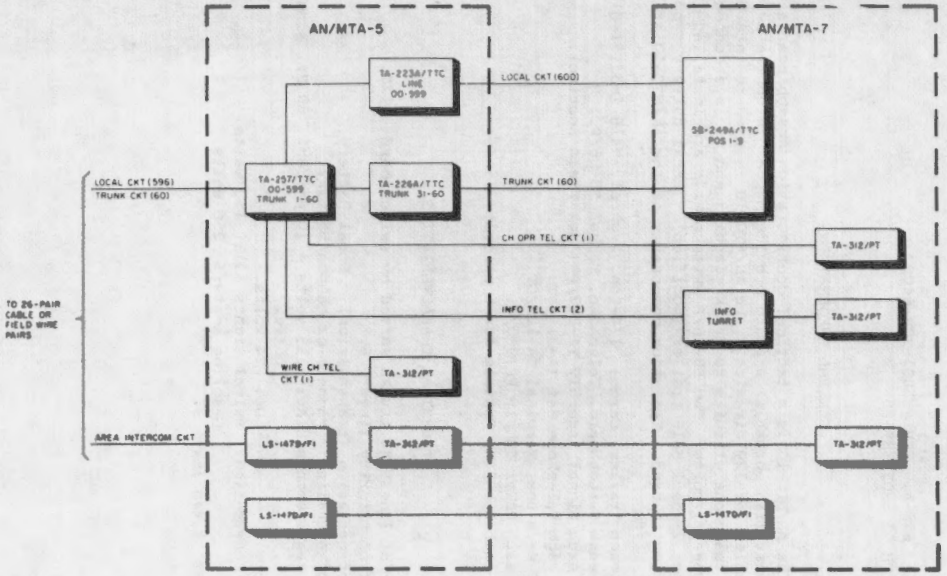
| | | |
|---|---|---|
| AN/MTA-7: | Heaters: | 4,500 watts |
| | Air Cond: | 3,000 watts |
| | Other: | 2,117 watts |
| | TOTAL: | 9,617 watts |
| AN/MTA-5: | Heaters: | 4,500 watts |
| | Air Cond: | 3,000 watts |
| | Other: | 1,559 watts |
| | TOTAL: | 9,059 watts |

MOCOM items:
2 each Tractor, 5-ton M-275A2 (Generator sets not assigned).

Remarks:

The AN/MTA-7 and AN/MTA-5 are being replaced by the AN/MTA-7A and the AN/MTA-5A in which components of Telephone Central Office Group, Manual AN/GTA-14 (instead of the AN/TTC-7) are used.


AN/MTA-7
LS-147
INFO OP
80
81
CHIEF OP
83
20 CPS 90 V
LOCAL INTERCOMM
SB-249 (9 TOTAL)
LOCAL TEL
26-PR CABLES (66 TOTAL)
48 VDC
AN/MTC-9
BB-46 (4 TOTAL)
SB-1032
SB-1032
26-PR CABLE (1 EACH)
20 CPS 90V
LOCAL TEL
60 TRUNKS
TA-257 (1)
TA-226 (3)
300 CB-LB
TA-257 (3)
TA-223 (3)
82
WIRE CHIEF
LOCAL INTERCOMM
296 CB-LB
TA-257 (3)
TA-223 (3)
LS-147
BINDING POST PANEL
80-83 4CB-LB
LS-147
AREA INTERCOMM
AN/MTA-5


AN/MTA-5
AN/MTA-7
TA-223A/TTC LINE 00-999
LOCAL CKT (600)
SB-2484/TTC POS 1-9
LOCAL CKT (596)
TRUNK CKT (60)
TA-257/TTC 00-599 TRUNK 1-60
TA-226A/TTC TRUNK 31-60
TRUNK CKT (60)
CH OPR TEL CKT (1)
TA-312/PT
INFO TEL CKT (2)
INFO TURRET
TA-312/PT
WIRE CH TEL CKT (1)
TA-312/PT
TO 26-PAIR CABLE OR FIELD WIRE PAIRS
AREA INTERCOM CKT
LS-1470/PT
TA-312/PT
TA-312/PT
LS-1470/PT
LS-1470/PT

## CENTRAL OFFICE GROUP, TELEPHONE AN/MTC-10

STATUS: STD-A; FSN: 5805-908-6400
REF: TM 11-5805-389-15

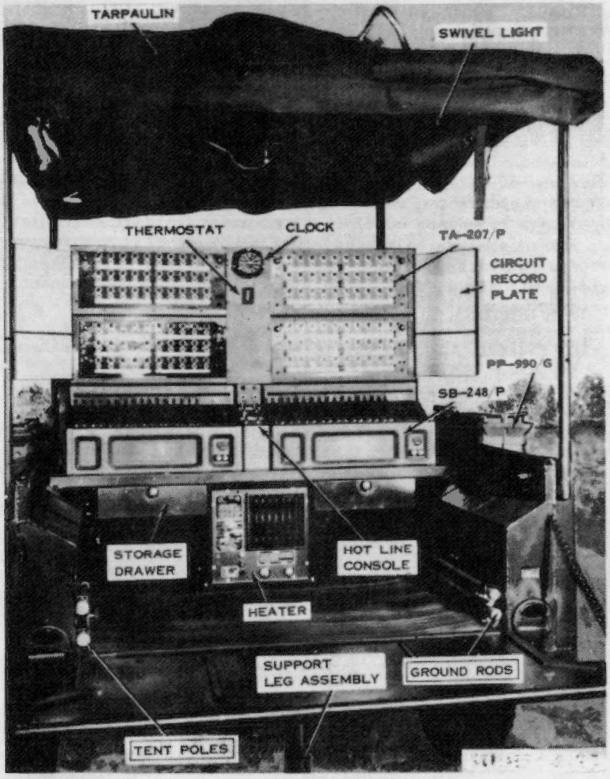
### GENERAL INFORMATION

The AN/MTC-10 is a tactical configuration assemblage (air- or vehicular-transportable) used to provide manual telephone switching facilities for 120 circuits. The AN/MTC-10 is used to interconnect local telephone circuits to trunk circuits and to interconnect local telephone circuits. Two SB-86/P switchboards are installed in a 1/4-ton, 2-wheel M416 trailer (modified). Local-battery type of operation is used. The major components of the AN/MTC-10 are:

1 each Trailer, Cargo: 1/4-ton, 2-wheel, M416 (modified).
2 each Switchboard, Telephone, Manual SB-86/P.
2 each Signal Assembly TA-207/P (Jack Field Section).
2 each Telephone Set TA-312/PT.
12 each Box, Terminal TA-125/GT.
2 each Power Supply PP-990/G.
1 each Hot Line Console for 6 priority lines.

### TECHNICAL CHARACTERISTICS

Number of lines and trunks served by switchboard: 120.
Number of priority lines: 6.
Type of operation (transmission): Local battery.
Type of signaling: Magneto or common battery.
Power requirements: Ac: 115 volts $\pm$ 10 percent, 60 Hz, single-phase.
Dc: 24 volts.
Power consumption: Swivel lights (3): 150 watts.
Gasoline heater: 250 watts.
Weight: 1,440 lbs.




**Central Office Group, Telephone AN/MTC-10.**

CENTRAL OFFICE, TELEPHONE, MANUAL
AN/TTC-23

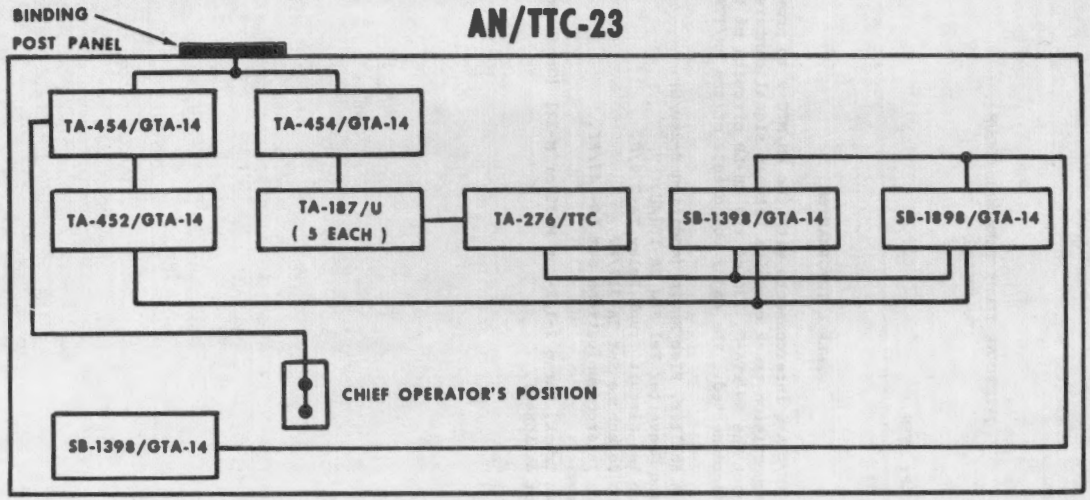
STATUS: STD-A; FSN: 5805-930-9303
REF: TM 11-5805-391-15

GENERAL INFORMATION

The AN/TTC-23 will replace the AN/MTC-3. The AN/TTC-23 is a manual telephone switching facility which provides terminations for local- or common-battery subscriber circuits, and manual or dial trunks. It includes two switchboard positions (SB-1398/GTA-14's) connected in a two-panel multiple arrangement, plus the required relays, main distribution frames and a power panel. The relays provide for termination of 100 local- or common-battery subscriber circuits, and 20 plug supervision trunks. The major components of the AN/TTC-23 are:

1 each Shelter, Electrical Equipment S-( )/TTC-23 (modified S-280/G).
2 each Telephone, Main Distribution Frame TA-454/GTA-14.
2 each Switchboard, Telephone, Manual SB-1398/GTA-14.
1 each Telephone Circuit Line Relay TA-452/GTA-14.
1 each Telephone Circuit Trunk Relay TA-276A/TTC-7.
5 each Converter, Telephone Signal TA-187/U.
1 each Power Panel SB-1399/GTA-14.
2 each Telephone Set TA-312/PT.
1 each Intercommunications Set LS-147/FI.

MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.
1 each Generator Set.


AN/TTC-23
BINDING POST PANEL
TA-454/GTA-14
TA-454/GTA-14
TA-452/GTA-14
TA-187/U ( 5 EACH )
TA-276/TTC
SB-1398/GTA-14
SB-1898/GTA-14
CHIEF OPERATOR'S POSITION
SB-1398/GTA-14

## TELEPHONE TRUNK TERMINAL GROUP AN/TTA-6

STATUS: LP; FSN:
REF:

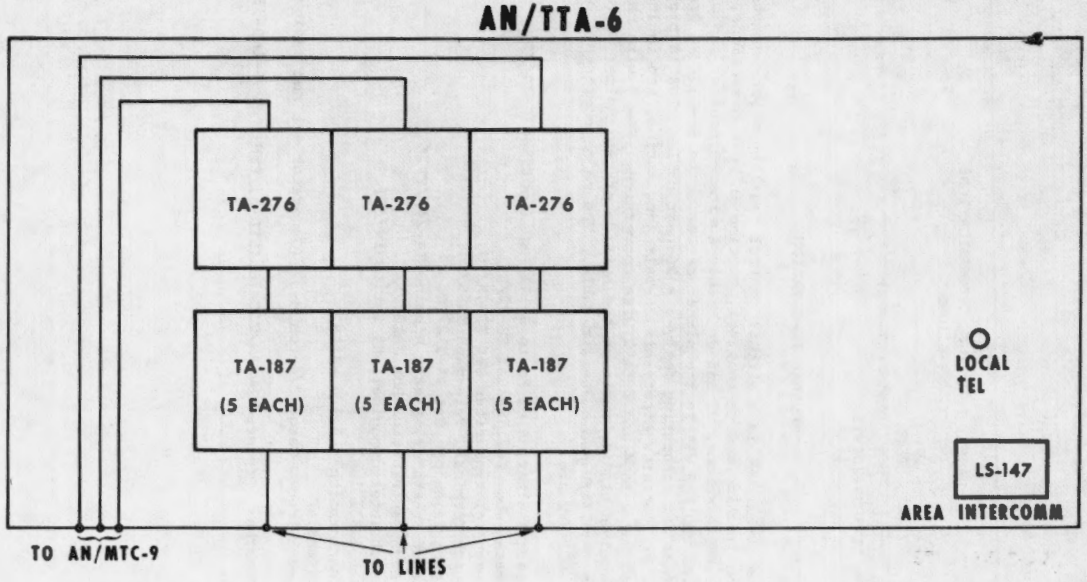
### GENERAL INFORMATION

The AN/TTA-6 interconnects with the AN/MTC-9 to provide 60 plug-supervision trunk circuits between signal centers. To interconnect the AN/TTA-6, 130 of the CB-LB circuits of the AN/MTC-9 must be disconnected. The major components of the AN/TTA-6 are:

1 each Shelter, Elec Equip (modified S-280/G).
15 each Converter Tel Sig TA-187/U.
3 each Tel Circuit Trunk Relay TA-276/G.
1 each Telephone Set TA-312/PT.
1 each Intercommunications Set LS-147/FI.

MOCOM items:

1 each Truck, Cargo 2-1/2-ton M-35 or M-221 (Generator set not assigned).


AN/TTA-6
TA-276
TA-276
TA-276
TA-187
(5 EACH)
TA-187
(5 EACH)
TA-187
(5 EACH)
LOCAL
TEL
LS-147
AREA INTERCOMM
TO AN/MTC-9
TO LINES

PANEL, PATCHING, COMMUNICATIONS
SB-611/MRC

STATUS: STD-B; FSN: 6806-167-7881
REF: TM 11-5805-204-15

GENERAL INFORMATION

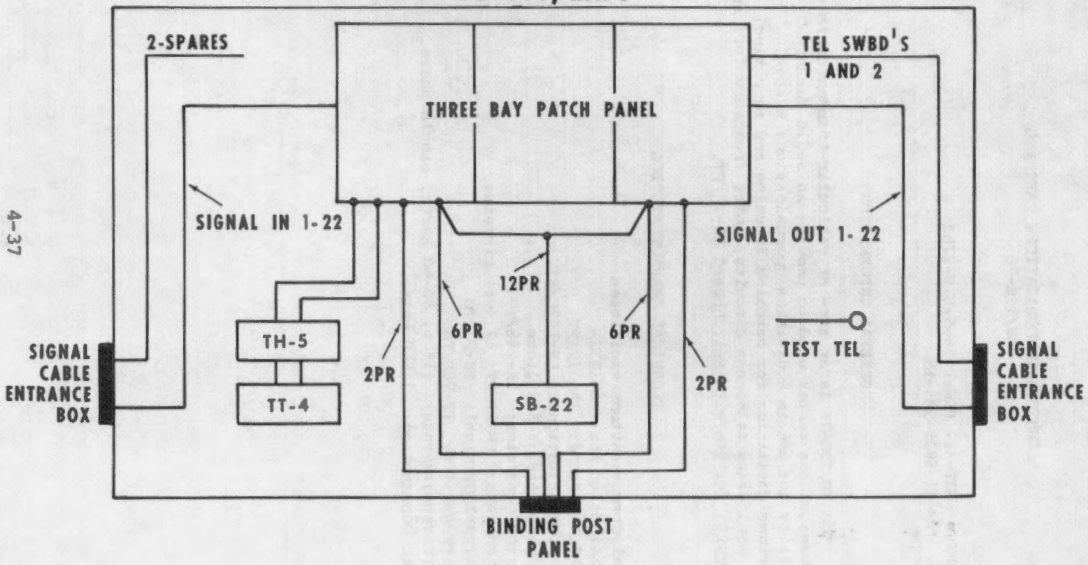
The SB-611/MRC is a circuit control facility which permits patching (routing and re-routing), testing in both directions, and monitoring telephone, vf and dc teletypewriter circuits, and circuits between and within the signal center. The SB-611/MRC provides facilities for connecting forty-six 26-pair cables plus 18 field wire pairs, contains ninety-six 26-pair jack strips, and includes a hybrid for 2 to 4 and 4 to 2 wire conversion. Field wire may be terminated on binding posts on the outside of the shelter or by using a J-1077A/U and a 26-pair cable. The major components of the SB-611/MRC are:

1 each Shelter, Elec Equip S-171/MRC (modified S-144/G).
1 each Swbd, Tel, Manual SB-22/PT.
1 each Teletypewriter Set TT-4A/TG.
1 each Terminal, Telegraph TH-5/TG.
1 each Telephone Set TA-312/PT.
1 each Generator, Static Ringing TA-248/TT.
2 each Distribution Box J-1077A/U.
1 each Intercommunications Set IS-147/FI.

Weight: 1,831 lbs.
Power consumption: 2,108 watts.
MOCOM items:
1 each Truck, Cargo 3/4-ton M-37 (Generator set not assigned).

Remarks: Replaced by AN/TSC-76 (STD-A; FSN: 5895-168-1574).

# SB-611/MRC


2-SPARES
THREE BAY PATCH PANEL
TEL SWBD'S
1 AND 2
SIGNAL IN 1-22
SIGNAL OUT 1-22
12PR
6PR
6PR
TH-5
TT-4
2PR
2PR
SB-22
TEST TEL
SIGNAL
CABLE
ENTRANCE
BOX
SIGNAL
CABLE
ENTRANCE
BOX
BINDING POST
PANEL

## CENTER, COMMUNICATIONS PATCHING
## AN/TSC-76

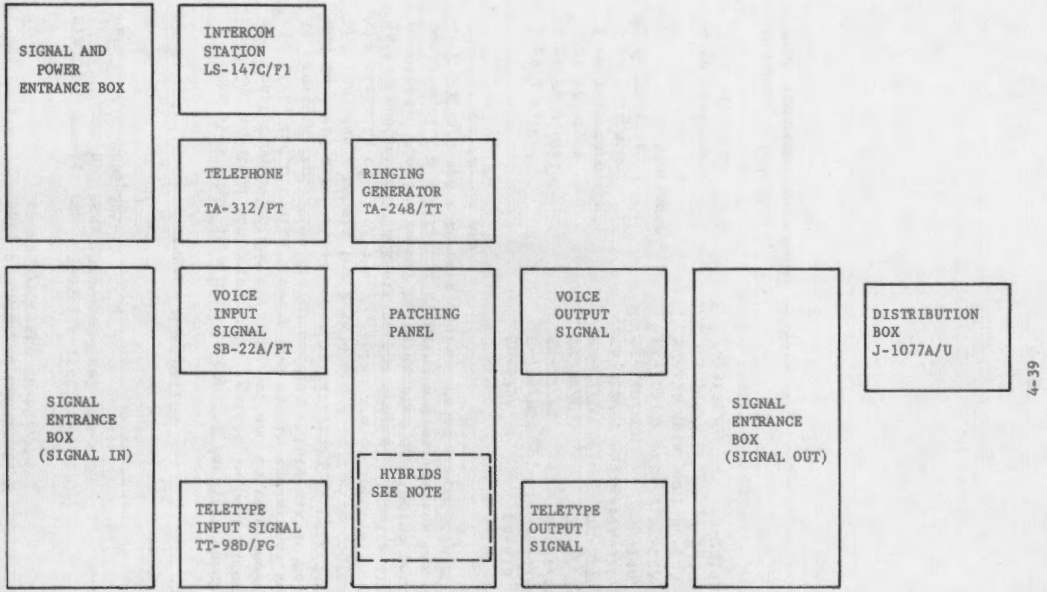
STATUS: STD-A; FSN: 5895-879-2702
REF: TM 11-5805-583-15

### GENERAL INFORMATION

The AN/TSC-76 is an air- or vehicular-transportable patching communications center used to provide an audio technical control facility for use in a division communications system. The AN/TSC-76 provides facilities for patching (routing and rerouting), testing, and monitoring telephone circuits, voice frequency (vf) and tone circuits for use with switchboard SB-22/PT.

### TECHNICAL CHARACTERISTICS

Local Communications Facilities
Distribution Box: J-1077A/U.
Field Telephone: TA-312/PT.
Intercommunications: LS-147C/FI.
Patching Panel: 572 lines.
Ringing Generator: TA-248/TT.
Switchboard: SB-22/PT 12 (vf) circuits.
Telegraph Terminal: TH-22/TG.
Teletypewriter: TT-98D/FG.
Power requirements: 115 v, 50-60 Hertz, single phase.
Power consumption: 3,500 watts.




NOTE: HYBRIDS USED FOR PATCHING FOUR WIRES TO TWO WIRES.

AN/TSC-76 FUNCTIONAL BLOCK DIAGRAM

## PANEL, PATCHING, COMMUNICATION SB-675A/MSC AND SB-675/MSC

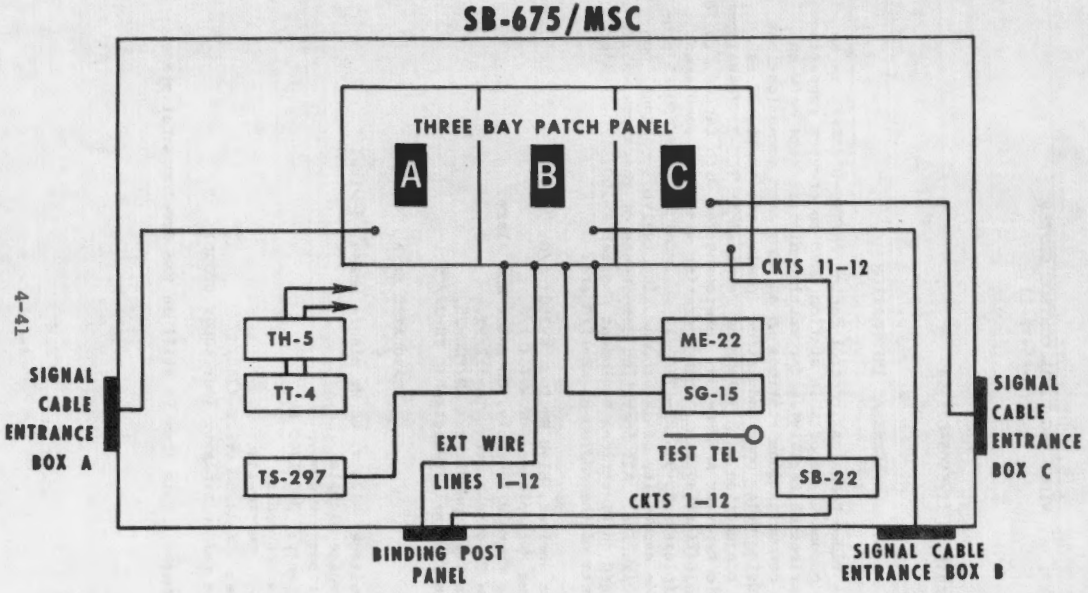
STATUS: STD-A; FSN: 5805-168-1548 (SB-675A)
STD-B; FSN: 5805-167-7882 (SB-675)
REF: TM 11-5895-225-15

### GENERAL INFORMATION

The SB-675/MSC is a circuit control facility which permits patching (routing and rerouting), testing in both directions, and monitoring telephone circuits, vf and dc teletypewriter circuits, and circuits between and within the signal center. It provides facilities for connecting thirty-six 26-pair cables and 24 field wire pairs, contains sixty-six 26-pair jack strips, and includes a hybrid for 2 to 4 and 4 to 2 wire conversion. The circuits of 23 of the 36 cables are equipped with monitoring jacks, and several jack strips for special circuits are also provided. Field wire may be terminated on binding posts on the outside of the shelter or by using a distribution box (J-1077A/U or J-2317A/U and a 26-pair cable. Major components of the SB-675A and SB-675 are:

| | SB-675A | SB-675 |
|---|---|---|
| 1 ea Shelter | S-404/MSC | S-144/MSC |
| 1 ea Swbd, Tel | SB-22/PT | SB-22/PT |
| 1 ea Teletype | TT-98/FG | TT-4A/TG |
| 1 ea Telegraph, Ter | TH-22/TG | TH-5/TG |
| 3 ea Telephone | TA-312/PT | (2ea)TA-312/PT |
| 1 ea Test Set | TS-140/PCM | TS-140/PCM |
| Includes | ME-22A(db meter) | ME-22A (db meter) |
| | SG-15A (sig gen) | SG-15A (sig gen) |
| 4 ea Dist Box | J-1077A/U | J-1077A/U |
| 3 ea Dist Box | J-2317A/U | J-2317A/U |

Weight: 2,644 lbs.
Power consumption: 3,832 watts.


SB-675/MSC
THREE BAY PATCH PANEL
A
B
C
CKTS 11–12
TH-5
TT-4
ME-22
SG-15
SIGNAL CABLE ENTRANCE BOX A
SIGNAL CABLE ENTRANCE BOX C
EXT WIRE
LINES 1–12
TEST TEL
TS-297
SB-22
CKTS 1–12
BINDING POST PANEL
SIGNAL CABLE ENTRANCE BOX B

## VIDEO TECHNICAL CONTROL CENTER
## AN/TSQ-85(XE-1)

STATUS: D; FSN:
REF: Draft TM 11-5805-625-14

### GENERAL INFORMATION

The video technical control center AN/TSQ-85(XE-1) is an air- or ground-transportable station used to provide repeating and distribution facilities for routing digital data between various communications stations in an army area communications system using pulse code modulation (pcm). The AN/TSQ-85 is used in conjunction with Telephone Terminal AN/TCC-73 (developmental) and Radio Repeater AN/TRC-138, interconnected with cables, to form a communications system. When operating with full complement of Multiplexers TD-976(XE-1)/G (12 maximum), the AN/TSQ-85 provides the capability of interconnecting twelve 96-channel pcm groups circuits. All operating components of the AN/TSQ-85(XE-1) are housed in Electrical Equipment Shelter S-280( )/G. Major components of the AN/TSQ-85(XE-1)/G are:

1 ea Shelter, Elec Equip: S-280( )/G.
12 ea Multiplexer: TD-976( )/G.
1 ea Console Assembly, Operator and Alarm.
1 ea Telephone Set: TA-312/PT.
1 ea Teletypewriter: AN/FGC-25.
1 ea Terminal, Telegraph: TH-22/TG.

### TABULATED DATA

Input voltage: 120 v, 60 Hz single phase, 3-wire.
Analog voice signals:
  Amplitude: 0 dbm.
  Frequency: 300-1700 Hz.
Transmission media:
  Radio: AN/GRC-144.
  Cable: CX-11230 or CX-4245/G.
Channels per multiplexer (per super group): 8.

Remarks: This item is still in the developmental stage.

## Section IV. TELETYPEWRITER TERMINAL AND RELAY EQUIPMENT

### CENTRAL OFFICE, TELETYPEWRITER AN/MGC-9

STATUS: STD-B; FSN: 5815-945-6606
REF: TM 11-5815-210-15

#### GENERAL INFORMATION

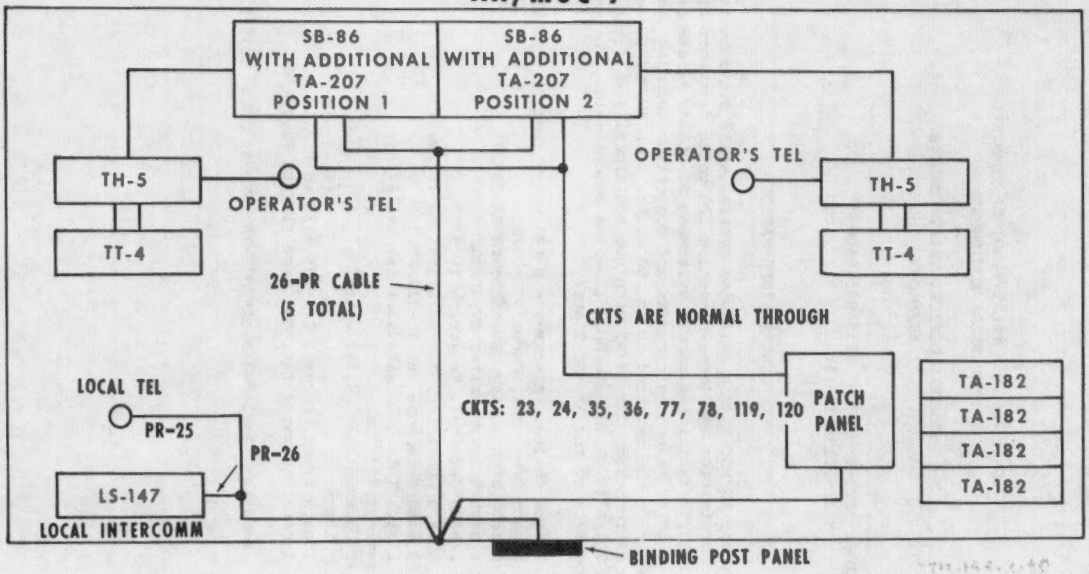
The AN/MGC-9 is a switching central which provides facilities for terminating and interconnecting 120 voice frequency circuits. Operator's facilities permit switching of either teletypewriter circuits or telephone circuits and converting incoming signaling from vf to the required 20 Hz, 90 volts. The AN/MGC-9 includes two switchboards (SB-89/P) with two additional jack field sections (TA-207/P's) which make up a 120-line switchboard. The major components of the AN/MGC-9 are:

1 each Shelter, Elec Equip S-190/MGC-9 (modified S-141/G).
2 each Swbd, Tel, Manual SB-86/P.
2 each Signal Assy, Switchboard TA-207/P.
2 each Teletypewriter TT-4A/TG.
2 each Terminal, Telegraph TH-5/TG.
4 each Converter, Tg-Tel Signal TA-182/U.
3 each Telephone Set TA-312/PT.
1 each Intercommunications Set LS-147/FI.

Weight: 2,754 lbs.
Power consumption: 4,212 watts.
MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 to M-211.
1 each Generator Set, Gas Eng, Tlr Mtd PU-474/M.

Remarks: Replaced by AN/MGC-9A (STD-A; FSN: 5815-053-2020).

# AN/MGC-9


SB-86
WITH ADDITIONAL
TA-207
POSITION 1
SB-86
WITH ADDITIONAL
TA-207
POSITION 2
TH-5
OPERATOR'S TEL
TT-4
OPERATOR'S TEL
TH-5
TT-4
26-PR CABLE
(5 TOTAL)
CKTS ARE NORMAL THROUGH
LOCAL TEL
PR-25
PR-26
LS-147
LOCAL INTERCOMM
CKTS: 23, 24, 35, 36, 77, 78, 119, 120
PATCH
PANEL
TA-182
TA-182
TA-182
TA-182
BINDING POST PANEL

CENTRAL OFFICE, TELETYPEWRITER
AN/MGC-9A

STATUS: STD-A; PSN: 5815-878-4618
REF: TM 11-5815-210-15-1

GENERAL INFORMATION

The AN/MGC-9A is a switching central which provides facilities for terminating and interconnecting 120 voice frequency (vf) circuits. Operators facilities permit switching of either teletypewriter circuits or telephone circuits and converting incoming signaling from vf to the required 20 Hz, 90 volts. The AN/MGC-9A includes two switchboards (SB-86/P) with two additional jack field sections (TA-207/P) which make up a 120-line switchboard. The major components of the AN/MGC-9A are:

1 ea Shelter, Elec Equip S-368/MGC-9A.
2 ea Switchboard SB-86/P.
2 ea Signal Assy, Switchboard TA-207/P.
2 ea Teletypewriter TT-98/FG.
2 ea Terminal, Telegraph TH-22/TG.
4 ea Converter, Telegraph-Telephone Sig CV-425/U.
3 ea Telephone Set TA-312/PT.
1 ea Intercommunications Set LS-147/FI.

Power requirements: 115 v, 60 Hertz single phase, 3-wire, 55 amperes.
Power consumption: 5,527 watts (total).
MOCOM items:

1 ea Truck, Cargo 2-1/2-ton M-35 to M-211.
1 ea Generator Set, Gas Eng, Tlr Mounted PU-474/M.

## CENTRAL OFFICE, TELETYPEWRITER AN/MGC-17

STATUS: STD-B; FSN: 5815-926-0162
REF: TM 11-5815-205-15 MWO 11-5815-205-15

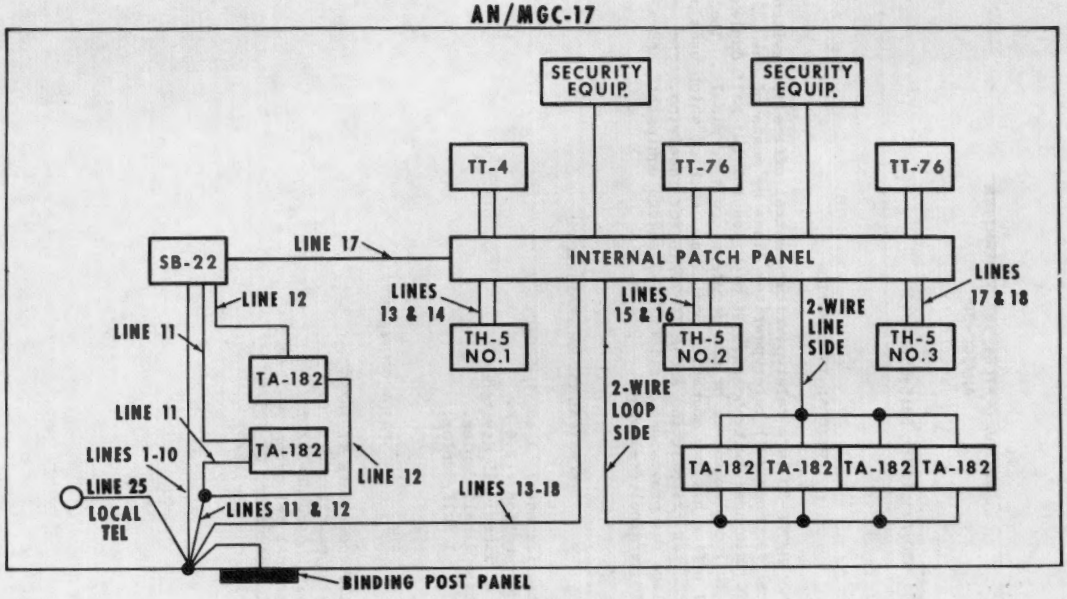
### GENERAL INFORMATION

The AN/MGC-17 is a vf telegraph switching center. It provides terminating facilities for teletypewriter traffic on secure circuits and for switching teletypewriter circuits. Facilities are also provided for tape and keyboard transmission and for tape and page reception. By using the two TT-76B/GGC's and security equipment, operation on two half-duplex or one full-duplex secure circuits is possible. The TT-4A/TG can be used to obtain page copy of incoming messages; or, it can be used for switching circuits with the SB-22/PT. Six signal converters (TA-182/U's) are provided for ringing conversion from 20 Hz to either 1,225 Hz or 1,600 Hz. The major components of the AN/MGC-17 are:

1 ea Shelter, Elec Equip S-169 (modified S-144/G).
1 ea Teletypewriter TT-4A/TG.
2 ea Teletypewriter TT-76B/GGC.
4 ea Terminal, Telegraph TH-5/TG.
1 ea Swbd, Tel SB-22/PT.
6 ea Converter, TG-Tel Sig TA-182/U.
2 ea COMSEC Equip TSEC/KW-7.

Weight: 1,400 lbs.
Power consumption: 3,113 watts.
MOCOM items:
Truck, Cargo 3/4-ton M-37.
Generator Set, Gas Eng, Tlr Mtd PU-322/G.

Remarks: Item replaced by AN/TGC-30 (STD-A)
TH-5 and TA-182/U are replaced by the TT-98/TG, TH-22 and CV-425/U, respectively.


AN/MGC-17
SECURITY EQUIP.
SECURITY EQUIP.
TT-4
TT-76
TT-76
SB-22
LINE 17
INTERNAL PATCH PANEL
LINES 17 & 18
LINE 12
LINES 13 & 14
LINES 15 & 16
2-WIRE LINE SIDE
LINE 11
TH-5 NO.1
TH-5 NO.2
TH-5 NO.3
TA-182
2-WIRE LOOP SIDE
LINE 11
LINES 1-10
TA-182
TA-182
TA-182
TA-182
TA-182
LINE 25
LOCAL TEL
LINE 12
LINES 13-18
LINES 11 & 12
BINDING POST PANEL

## CENTRAL OFFICE, TELETYPEWRITER AN/TGC-30

STATUS: STD-A; FSN: 5815-156-4365
REF:

### GENERAL INFORMATION

The AN/TGC-30 is a teletypewriter central office for switching 15 voice frequency (vf) teletypewriter lines by means of one SB-22/TG telephone switchboard. It provides for two half duplex or one full duplex secure or non-secure circuit terminals. The central office has two operating positions, each of which uses a TT-76/GGC for transmitting and a TT-98/TG for receiving. The assemblage has provisions for TSEC/KW-7 secure equipment, and a TH-22/TG terminal, telegraph.

### TECHNICAL CHARACTERISTICS

Power requirements: 1 ea PU-628/U.
Power consumption: 2.6 kw
Number of lines: 15 (switched).
Circuits: 2 half duplex.
1 full duplex.

### MAJOR COMPONENTS

2 ea Teletypewriters TT-76/GGC.
2 ea Teletypewriters TT-98/TG.
1 ea Switchboard SB-22/PT.
3 ea Terminal Telegraph TH-22/TG.
6 ea Sig Converters CV-425/G.
1 ea Telephone TA-312/PT.

## CENTRAL OFFICE, TELETYPEWRITER AN/MGC-32

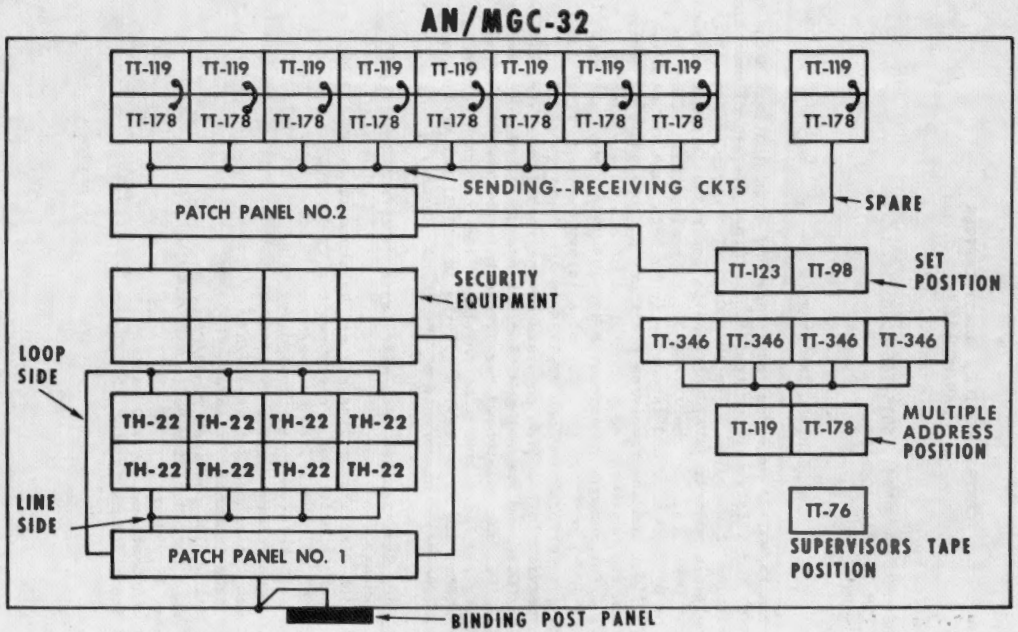
STATUS: STD-A; FSN: 5815-766-5076
REF: TM 11-5815-309-15

### GENERAL INFORMATION

The AN/MGC-32 provides facilities and communications security (COMSEC) for teletypewriter traffic (terminal operation) over eight half-duplex vf circuits. The AN/MGC-32 also provides facilities for multiple-address (ZVA) messages, a supervisor's position and one set position. In the AN/MGC-32, transmission is either by tape or by keyboard, and reception is by both tape and page copy. Eight sending-receiving positions and one spare or poking position are provided, each consisting of one teletypewriter (TT-119A/FG) and one reperforator (TT-178A/FG). The multiple-address (ZVA) position consists of a teletypewriter (TT-119A/FG) and five reperforators (one TT-178A/FG and four TT-346/FG's). The supervisor's position consists of one reperforator-transmitter (TT-76B/GGC), and the set position has one distirbutor-transmitter (TT-123/FG), one teletypewriter (TT-98/FG), and COMSEC equipment (TSEC/KW-7). Eight operating and two spare telegraph terminals (TH-22/TG's) are also provided in the AN/MGC-32 for vf line operation. The major components of the AN/MGC-32 are:

1 each Semi-Trailer Van, Eltr Equip V-317/MGC (modified M-348A2).
1 each Distributor Transmitter, Teletypewriter TT-123/FG.
4 each Reperforator, Teletypewriter TT-346/FG.
1 each Teletypewriter TT-76B/GGC.
10 each Teletypewriter TT-119A/TG.
10 each Teletypewriter TT-178A/TG.
1 each Telephone Set TA-312/PT.
10 each Terminal, Telegraph TH-22/TG.
1 each Teletypewriter TT-98/FG.
8 each Comm Security Equip TSEC/KW-7.

Weight: 18,990 lbs.
Power consumption: 18,740 watts.
MOCOM items: 1 ea Tractor, 2-1/2-ton, M-275A2.


AN/MGC-32
TT-119
TT-178
SENDING--RECEIVING CKTS
SPARE
PATCH PANEL NO.2
SECURITY EQUIPMENT
TT-123
TT-98
SET POSITION
TT-346
LOOP SIDE
TH-22
MULTIPLE ADDRESS POSITION
LINE SIDE
TT-76
SUPERVISORS TAPE POSITION
PATCH PANEL NO. 1
BINDING POST PANEL

## OPERATIONS CENTRAL, TELETYPEWRITER AN/MGC-19

STATUS: STD-A; FSN: 5815-923-2400
REF: TM 11-5895-222-15, MWO 11-5895-222-30

### GENERAL INFORMATION

The AN/MGC-19 is an air- or ground-transportable assemblage of teletypewriter equipments. It includes facilities which may be used to obtain 14 direct current half duplex circuits or 7 voice frequency (vf) or direct current (dc) full duplex circuits. The set is used in signal centers of an area-type communications system.

### TECHNICAL CHARACTERISTICS

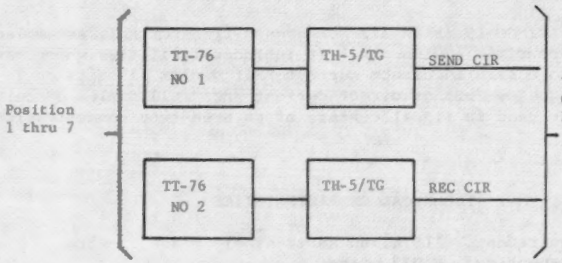
Power requirement: 115 v, 60 Hertz single phase, 3-wire.
Power consumption: 8,032 watts.

### TELETYPEWRITER COMMUNICATIONS FACILITIES

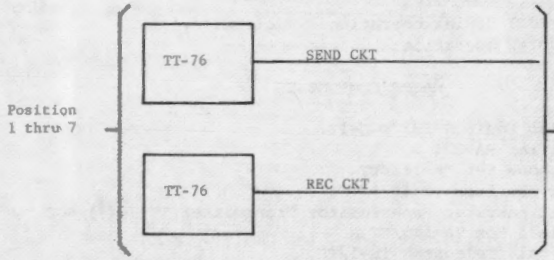
Dc or vf, full duplex operation: 7 circuits.
Dc half duplex operation: 14 circuits.

### MAJOR COMPONENTS

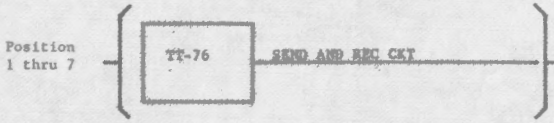
1 ea Shelter Equip S-182/MGC-19.
2 ea Rectifier RA-87( ).
1 ea Telephone Set TA-312/PT.
1 ea Teletypewriter TT-4( )/TG.
14 ea Teletypewriter Reperforator Transmitter TT-76( )/GGC.
1 ea Terminal Box TA-125/GT.
8 ea Terminal, Telegraph TH-5/TG.
1 ea Trailer-Mounted Generator Set PU-294/G.




A. FULL-DUPLEX VF CIRCUIT




B. FULL-DUPLEX DC




C. HALF-DUPLEX DC

## RELAY CENTRAL, TELETYPEWRITER AN/MGC-23

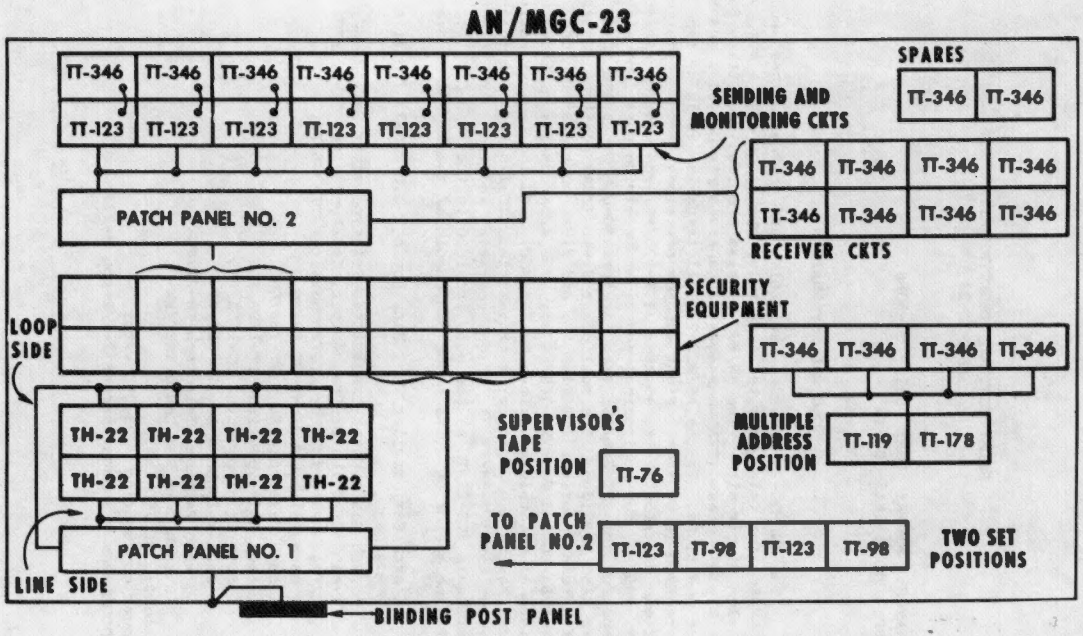
**STATUS:** STD-A; **FSN:** 5815-766-5086
**REF:** TM 11-5815-308-15

### GENERAL INFORMATION

The AN/MGC-23 provides facilities and communications security (COMSEC) for teletypewriter tape relay operation over eight full-duplex vf circuits. The AN/MGC-23 also provides facilities for multiple-address (ZVA) messages, a supervisor's position and two set positions. In the AN/MGC-23, all transmission is by tape and reception is by tape. Eight sending positions, each consisting of one distributor-transmitter (TT-123/FG) and one reperforator (TT-346/FG) for monitoring, and eight receiving positions with one reperforator (TT-346/FG) each, are provided. Two spare TT-346/FG's are also provided. The multiple address (ZVA) position consists of a teletypewriter (TT-119A/FG) and five reperforators (one TT-178A/FG and four TT-346/FG's). The supervisor's position consists of one teletypewriter TT-76B/GGC; and, the two set positions each having one distributor-transmitter (TT-123/FG), one teletypewriter (TT-98/KW-7). Eight operating and two spare telegraph terminals (TH-22/TG's) are also provided in the AN/MGC-23 for vf line operation. The major components of the AN/MGC-23 are:

1 each Semi-Trailer Van, Eltr Equip V-318/MGC-23 (modified M-348A2).
4 each Distributor-Transmitter Teletypewriter Set AN/GGC-9.
1 each Distributor-Transmitter, Teletypewriter TT-123/FG.
22 each Reperforator, Teletypewriter TT-346/FG.
2 each Teletypewriter TT-98/FG.
1 each Teletypewriter TT-76B/GGC.
1 each Teletypewriter TT-119A/FG.
1 each Teletypewriter TT-178A/FG.
1 each Telephone Set TA-312/PT.
10 each Terminal Telegraph TH-22/TG.
16 each Comm Sec Equip TSEC/KW-7.

**Weight:** 21,790 lbs.
**Power consumption:** 23,290 watts.
**MOCOM item:** 1 each tractor 2-1/2-ton M-275A2.


AN/MGC-23
TT-346
TT-123
SENDING AND MONITORING CKTS
SPARES
PATCH PANEL NO. 2
RECEIVER CKTS
SECURITY EQUIPMENT
LOOP SIDE
TH-22
SUPERVISOR'S TAPE POSITION
TT-76
MULTIPLE ADDRESS POSITION
TT-119
TT-178
TO PATCH PANEL NO.2
TT-98
TWO SET POSITIONS
PATCH PANEL NO. 1
LINE SIDE
BINDING POST PANEL

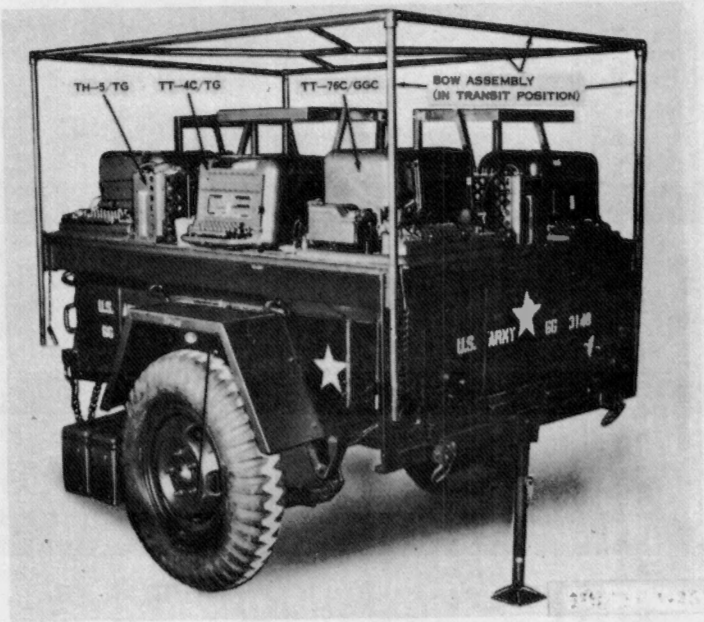
## TERMINAL TELEGRAPH
## AN/MGC-34

STATUS: STD-A; FSN: 5805-908-6398
REF: TM 11-5805-390-15

### GENERAL INFORMATION

The AN/MGC-34 is a teletypewriter terminal assemblage. It provides an airmobile teletypewriter facility for an airmobile division. Three teletypewriter positions are available. The equipment is installed in a 1/4 ton trailer, M-416 (modified). The major components of the AN/MGC-34 are:

3 ea Teletypewriter TT-4A/TG.
3 ea Teletypewriter TT-76B/GGC.
6 ea Terminal Telegraph TH-5/TG.
1 ea Panel, Patch
3 ea Comm Security Equip TSEC/KW-7.


TH-5/TG
TT-4C/TG
TT-76C/GGC
BOW ASSEMBLY
(IN TRANSIT POSITION)
U.S. ARMY

## TERMINAL TELEGRAPH
## AN/MSC-29

STATUS: STD-B; FSN: 5805-943-6762
REF: TM 11-5895-205-15

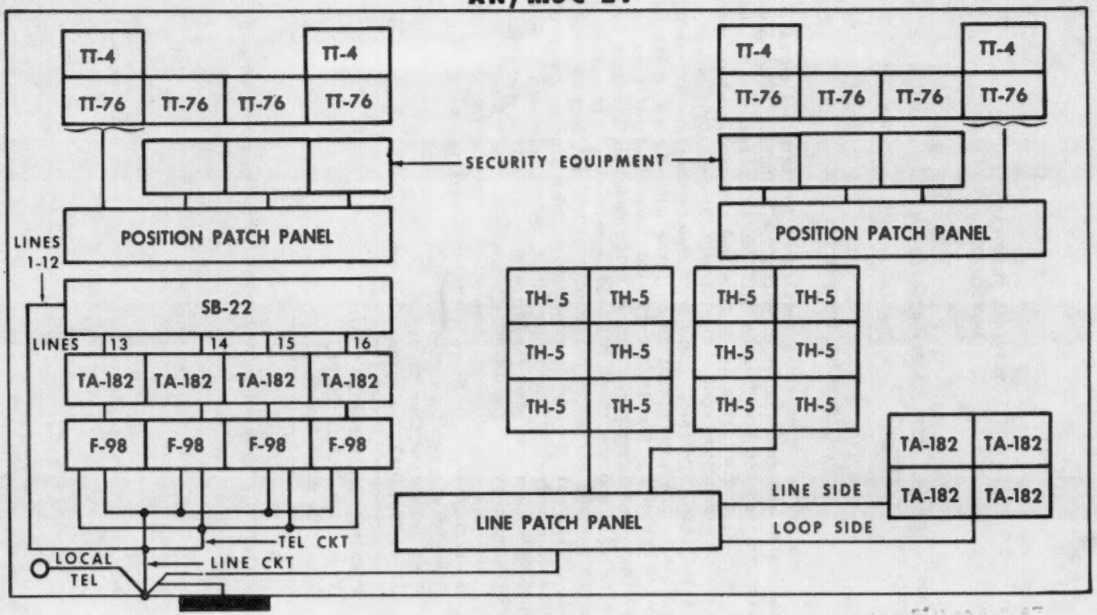
### GENERAL INFORMATION

The AN/MSC-29 provides facilities for terminal operation over half- and full-duplex circuits for switching teletypewriter circuits, and for speech-plus half-duplex operation. In the AN/MSC-29, transmission is by tape and keyboard, and reception is by tape and page copy. The AN/MSC-29 uses eight reperforator-transmitters (TT-76B/CGC) and four teletypewriters (TT-4A/TG's) to provide secure communications on three full-duplex or six half-duplex circuits. The AN/MSC-29 also provides facilities to terminate and interconnect 16 vf teletypewriter circuits by using the SB-22/P and the TT-4A/TG. For speech-plus half-duplex operation, the AN/MSC-29 has four F-98/U's and four TA-182/U's. Four additional TA-182/U's are provided for ringing conversion (20Hz to either 1,225 or 1,600 Hz). Twelve telegraph terminals (TH-5/TG's) are included for voice frequency line operation. Major components of the AN/MSC-29 are:

1 ea Shelter, Elec Equip S-179/MSC (modified S-141/G).
8 ea Teletypewriters TT-76B/CGC.
4 ea Teletypewriter TT-4A/TG.
12 ea Terminal, Telegraph TH-5/TG.
8 ea Converter, TG-Tel Sig TA-182/U.
4 ea Filter, Assembly F-98/U.
1 ea Swbd, Tel SB-22/PT.
1 ea Telephone Set TA-312/PT.
6 ea Comm Sec Equip TSEC/KW-7.

Remarks: Replaced by AN/TSC-58 (STD-A; FSN: 5805-010-5287).

# AN/MSC-29


TT-4
TT-4
TT-76
TT-76
TT-76
TT-76
SECURITY EQUIPMENT
TT-4
TT-4
TT-76
TT-76
TT-76
TT-76
POSITION PATCH PANEL
POSITION PATCH PANEL
LINES 1-12
SB-22
LINES
13
14
15
16
TA-182
TA-182
TA-182
TA-182
F-98
F-98
F-98
F-98
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TH-5
TA-182
TA-182
TA-182
TA-182
LINE SIDE
LOOP SIDE
LINE PATCH PANEL
TEL CKT
LOCAL TEL
LINE CKT

TEPMINAL TELEGRAPH
AN/TSC-58

STATUS: STD-A; FSN: 5805-010-5287
REF: TM 11-5805-574-15

GENEPAL INFOPMATION

The AN/TSC-58 is an air- or vehicular-transportable assemblage that serves as a voice frequency, cryptographic telegraph terminal. The AN/TSC-58 is used in a division area of an area-type communications system. It contains facilities for 3 voice frequency (vf) full duplex or 6 vf, half duplex circuits in either the secure or non-secure modes.

TECHNICAL CHARACTEPISTICS

Power requirements:
Input voltage: 115 v ac, 60 Hertz single phase
Consumption (total): 7,176 watts.

TELETYPEWRITER CIRCUITS AND FACILITIES

Secure synchronous circuits: 3 vf full duplex
6 vf half duplex
Noncurf circuits: 3 vf full duplex
6 vf half duplex
Tape preparation facilities: 6 (TT-76( )/GGC
Page printers: 6 (TT-98( )/FG
Switchboard capacity for local traffic: 12 direct current (dc) half duplex circuits

MAJOR COMPONENTS

8 ea Terminal, Telegraph TH-22/TG.
6 ea Teletypewriter Reperforator-Transmitter TT-76( )/TG.
6 ea Teletypewriter TT-98( )/FG.
6 ea Security Equipment TSEC/KW-7.
(Note: Not issued as part of equipment, must be requisitioned separately when required).

The AN/TSC-58 is STD-A item replaced the AN/MGC-29 which is now STD-B.

## TERMINAL TELETYPEWRITER AN/MGC-22

STATUS: STD-A; FSN: 5815-766-5080
REF: TM 11-5815-307-15

### GENERAL INFORMATION

The AN/MGC-22 provides facilities for secure teletypewriter traffic over four full-duplex vf circuits. Facilities for off-line tape preparation and a supervisor's position are also provided. In the AN/MGC-22, all transmission is by tape, and reception is both by tape and page copy. Four sending positions with tape monitor capability are provided by using four transmitter-distributors (TT-123/FG's) and four reperforators (TT-109/FG's). Four receiving positions are provided, each consisting of one reperforator (TT-346/FG) and one teletypewriter (TT-98/FG). The five off-line tape preparation positions in the AN/MGC-22 each consist of one TT-119A/FG and one TT-178A/FG (part of AN/FGC-25X). The supervisor's tape preparation position consists of one TT-76B/GGC; and, one set position (one TT-123/FG, one TT-98/FG and COMSEC equipment) is also provided. Teletypewriter terminals (four operating and two spare TH-22/TG's) are provided for voice frequency line operation. The major components of the AN/MGC-22 are:

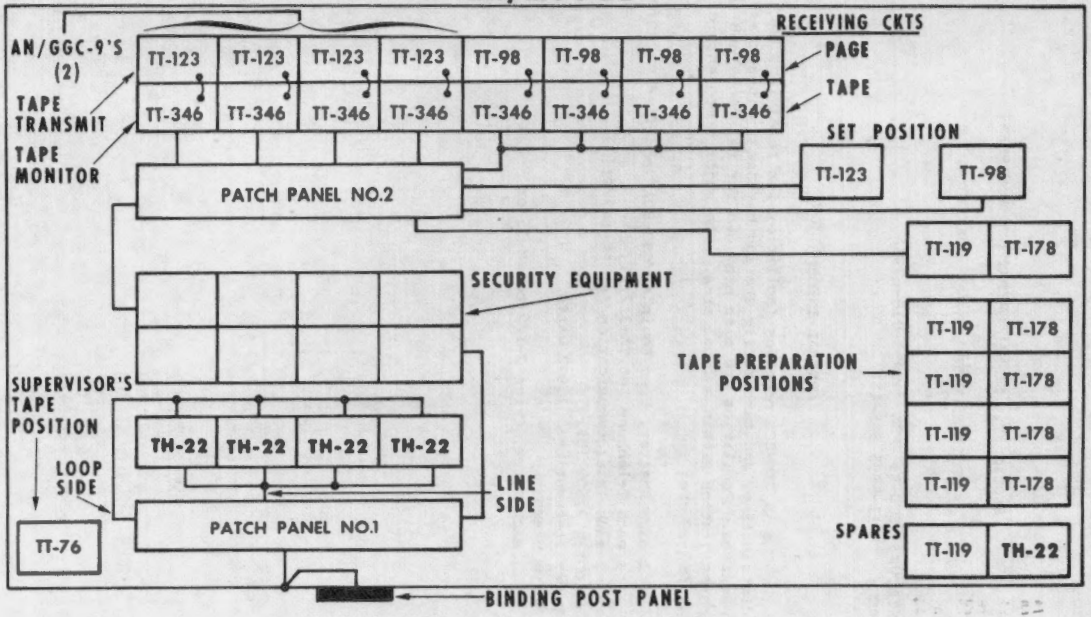
1 each Semi-Trailer Van, Eltr Equip V-317/MGC (modified M-348A2).
2 each Teletypewriter Set AN/GGC-9.
1 each Distributor-Transmitter.

Teletypewriter TT-123/FG

8 each Reperforator, Teletypewriter TT-346/FG.
5 each Teletypewriter TT-98/TG.
1 each Teletypewriter TT-76B/GGC.
5 each Teletypewriter TT-119A/FG.
5 each Teletypewriter TT-178A/FG.
1 each Telephone Set TA-312/PT.
8 each Terminal, Teletypewriter TH-22/TG.
8 each Comm Security Equip TSEC/KW-7.

Weight: 18,990 lbs.
Power consumption: 18,730 watts.
MOCOM item: 1 each Tractor, 2-1/2-ton-275A2.

# AN/MGC-22


RECEIVING CKTS
AN/GGC-9'S (2)
TT-123
TT-123
TT-123
TT-123
TT-98
TT-98
TT-98
TT-98
PAGE
TAPE
TAPE TRANSMIT
TAPE MONITOR
TT-346
TT-346
TT-346
TT-346
TT-346
TT-346
TT-346
TT-346
SET POSITION
TT-123
TT-98
PATCH PANEL NO.2
TT-119
TT-178
SECURITY EQUIPMENT
TT-119
TT-178
TAPE PREPARATION POSITIONS
TT-119
TT-178
TT-119
TT-178
TT-119
TT-178
SUPERVISOR'S TAPE POSITION
TH-22
TH-22
TH-22
TH-22
LOOP SIDE
LINE SIDE
PATCH PANEL NO.1
SPARES
TT-119
TH-22
TT-76
BINDING POST PANEL

## Section V. SIGNAL OPERATIONS EQUIPMENT

### MESSAGE CENTER AN/GSQ-80A

STATUS: STD-A; FSN: 9999-018-6795
REF: TM 11-5895-365-15

### GENERAL INFORMATION

The AN/GSQ-80A provides facilities for receiving, sorting, distributing, and temporarily storing messages, dispatches, and packages. Facilities are also provided for telephone and intercommunication within a local area. The major components of the AN/GSQ-80 are:

1 each Shelter, Elec Equip AN/GSQ-80A (modified S-280/G).
1 each Telephone Set TA-312/PT.
1 each Intercommunication Set IS-147/FI.
Weight: 2,600 lbs.
Power consumption: 1,992 watts.
MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.

MESSAGE CENTER, COMMUNICATIONS
AN/MSC-25

STATUS: STD-A; FSN: 5895-021-2088
REF: TM 11-5895-227-15

GENERAL INFORMATION

The AN/MSC-25 is a tactical configuration which provides facilities for local telephone circuits, telephone switching, teletypewriter circuits and intercommunication within the local area. The AN/MSC-25 also includes display boards and overlay screens required by the signal officer to plan, engineer and control area type communications systems. In addition, connections for FM or AM radio set inside the shelter to power and antenna equipment outside is also provided; however, a radio set is not a component. The major components of the AN/MSC-25 are:

1 each Semi-Trailer Van V-189/MSC-25 (modified M-348A2).
1 each Swbd, Tel Sb-22/PT.
1 each Teletypewriter TT-76B/GGC.
1 each Teletypewriter TT-4A/TG.
2 each Terminal, Telegraph TH-5/TG.
7 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.

Weight: 13,000 lbs.
Power consumption: 10,652 watts.
MOCOM item:
1 each Tractor 2-1/2-ton M-275A2.

## OPERATIONS CENTER, COMMUNICATION AN/MSC-31 AND AN/MSC-31A

STATUS: STD-A; FSN: 5895-168-1569 (AN/MSC-31A)
STD-B; FSN: 5895-167-7931 (AN/MSC-31)
REF: TM 11-5895-223-15

### GENERAL INFORMATION

The AN/MSC-31 is a tactical configuration which provides facilities for local telephone circuits, telephone switching, teletypewriter circuits and intercommunication within the local area. The AN/MSC-31 also includes display boards and overlay screens required by signal officer to plan, engineer and control area type communications systems. The major components of the AN/MSC-31 are:

1 each Shelter, Elec Equip S-183/MSC-31 (modified S-141).
1 each Swbd, Tel Manual SB-22/PT.
4 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.
Weight: 2,639.
Power consumption: 3,542 watts.
MOCOM item:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.

Remarks: The AN/MSC-31A replaces the AN/MSC-31. In the AN/MSC-31A shelter S-371/MSC-31A (modified S-280/G) facilities for installation of radio sets AN/GRR-5 and AN/VRC-47 and a 9,000 BTU air conditioner will be included. The radio sets will not be components of the AN/MSC-31A.

## OPERATIONS CENTRAL
## AN/MSC-32 AND AN/MSC-32A

STATUS: STD-A; FSN: 5895-167-7932 (AN/MSC-32A)
STD-B; FSN: 5895-167-7932 (AN/MSC-32)
REF: TM 11-5895-464-15

### GENERAL INFORMATION

The AN/MSC-32 is a tactical configuration which provides facilities for local telephone circuits, telephone switching, teletypewriter circuits and intercommunication within the local area. The AN/MSC-32 also provides display boards required by the signal officer to plan, engineer and control area-type communications systems. The major components of the AN/MSC-32 are:

1 each Shelter, Elec Equip S-184/MSC-32.
2 each Teletypewriter TT-4A/TG.
1 each Teletypewriter TT-76B/GGC.
1 each Switchboard, Tel Manual SB-22/PT.
3 each Terminal, Telegraph TH-5/PT.
4 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.

Weight: 2,761 lbs.
Power consumption: 4,292 watts.
MOCOM item:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.

Remarks: The AN/MSC-32A replaces the AN/MSC-32. In the AN/MSC-32A, Shelter S-373/MSC-32A will replace the S-184 and the TT-98/FG and TH-22/TG will replace the TT-4A/TG and TH-5/TG respectively. Facilities for installing radio sets AN/GRR-5 and AN/VRC-47 and a 9,000 BTU air conditioner will be included; however, the radio sets will not be components.

## Section VI. RADIO RELAY AND MULTIPLEX (FDM) EQUIPMENT

### REPEATER, TELEPHONE AN/MCC-3

STATUS: STD-A; FSN: 5805-167-7880
REF: TM 11-5805-286-15

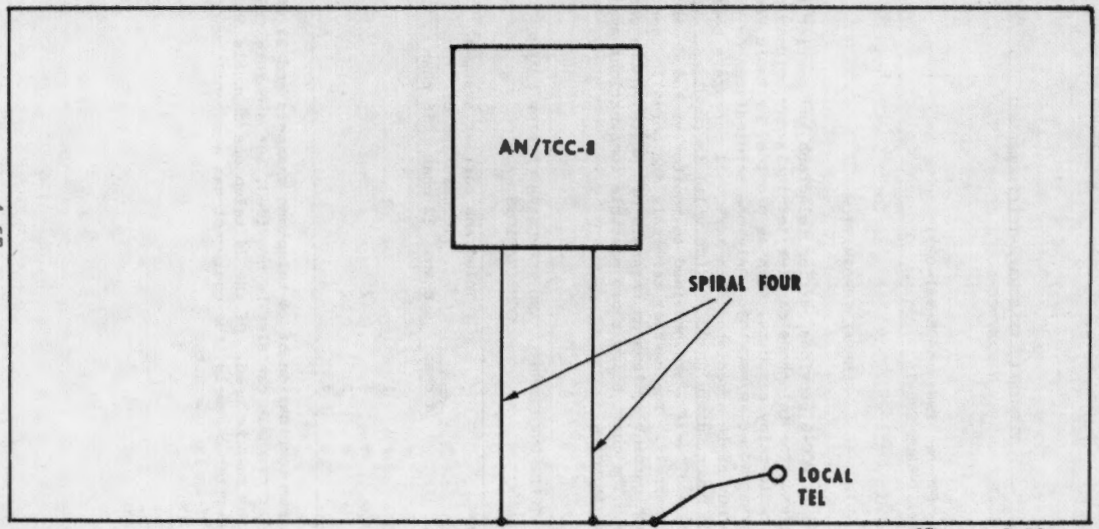
#### GENERAL INFORMATION

The AN/MCC-3 provides equalization, amplification and regulation for one 12-channel FDM carrier in an extended AN/TCC-7 cable system. The major components of the AN/MCC-3 are:

1 each Shelter, Elec Equip S-173/MCC-3 (modified S-166/G).
1 each Telephone Repeater AN/TCC-8.
2 each Telephone Test Set TS-712/TCC-11.
1 each Telephone Set TA-312/PT.

Weight: 1,450 lbs.
Power consumption: 2,735 watts.
MOCOM items:

1 each Truck, Cargo 3/4-ton M-37.
1 each Generator Set, Gas Eng, Mlr Mtd PU-456/G.


AN/TCC-8
SPIRAL FOUR
LOCAL
TEL

TERMINAL, TELEGRAPH-TELEPHONE
AN/MCC-6

STATUS: STD-A; FSN: 5805-941-0871
REF: TM 11-5805-285-15

GENERAL INFORMATION

The AN/MCC-6 provides carrier telegraph and carrier telephone facilities. The telephone carrier terminals may be used over normal radio-relay circuits, such as provided by Radio Repeater Sets AN/MRC-54 or AN/MRC-103. Only one terminal can be used over spiral-four cable associated with AN/TCC-11 repeaters because only one Power Supply PP-826/U (600 volt) is supplied. The TT-4A/TG and TH-5/TG are provided to monitor vf and dc teletypewriter channels. The carrier terminals are normally used to place telegraph carrier systems on channels of the telephone carrier systems. The chart below shows possible combinations available with the AN/MCC-6.

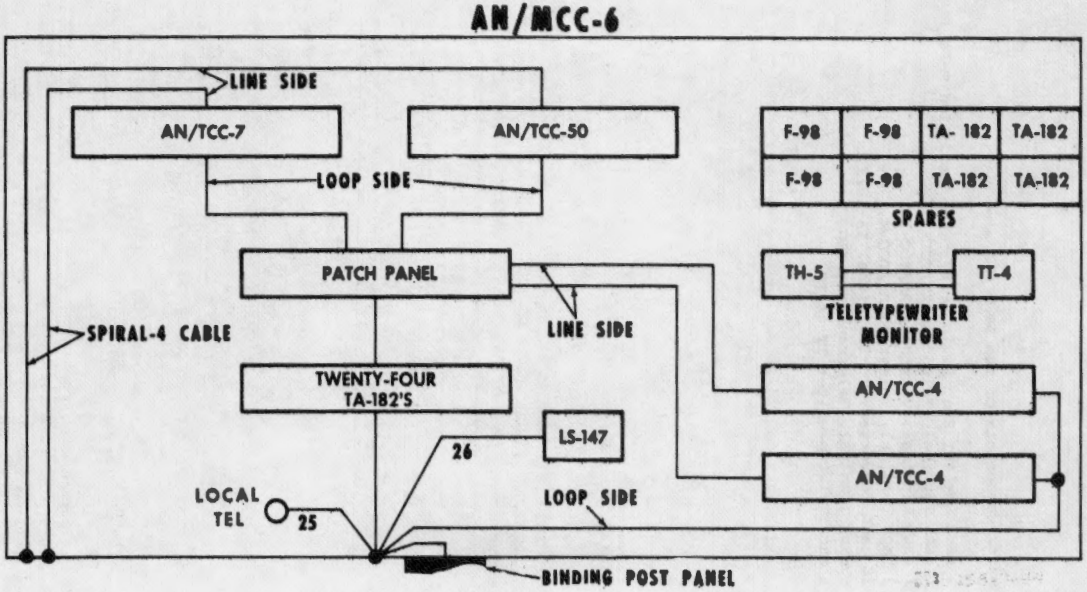
TELEPHONE CHANNELS AND TELEGRAPH CARRIER CHANNEL COMBINATIONS

| Telephone channels | + | Telegraph carrier systems consisting of | | | |
|---|---|---|---|---|---|
| | | 4 chan | 8 chan | 12 chan | 16 chan |
| 23 | + | | | | 1 |
| 22 | + | 1 | | 1 | |
| 22 | + | | 2 | | |
| 21 | + | 2 | 1 | | |
| 20 | + | 4 | | | |

The maximum combination of 24 telephone channels and 24 vf teletypewriter channels can also be provided, but separate transmission facilities must be used. Of the 24 telephone channels and 24 vf teletypewriter channels, the equipment has a capability of 8 speech-plus-half-duplex circuits.

The major components of the AN/MCC-6 are:

1 each Shelter Elec Equip S-185/MCC-6 (modified S-141/G).
1 each Terminal, Telephone AN/TCC-7.
1 each Terminal, Telephone AN/TCC-50.
2 each Terminal, Telegraph AN/TCC-4.
28 each Converter, Tg-Tel Signal TA-182/U.
8 each Terminal, Telegraph TH-5/TG.
1 each Teletypewriter TT-4A/TG.


AN/MCC-6
LINE SIDE
AN/TCC-7
AN/TCC-50
LOOP SIDE
F-98
F-98
TA- 182
TA-182
F-98
F-98
TA-182
TA-182
SPARES
PATCH PANEL
TH-5
TT-4
TELETYPEWRITER MONITOR
SPIRAL-4 CABLE
LINE SIDE
TWENTY-FOUR TA-182'S
AN/TCC-4
LS-147
26
AN/TCC-4
LOCAL TEL
25
LOOP SIDE
BINDING POST PANEL

## REPEATER SET, RADIO AN/MRC-54

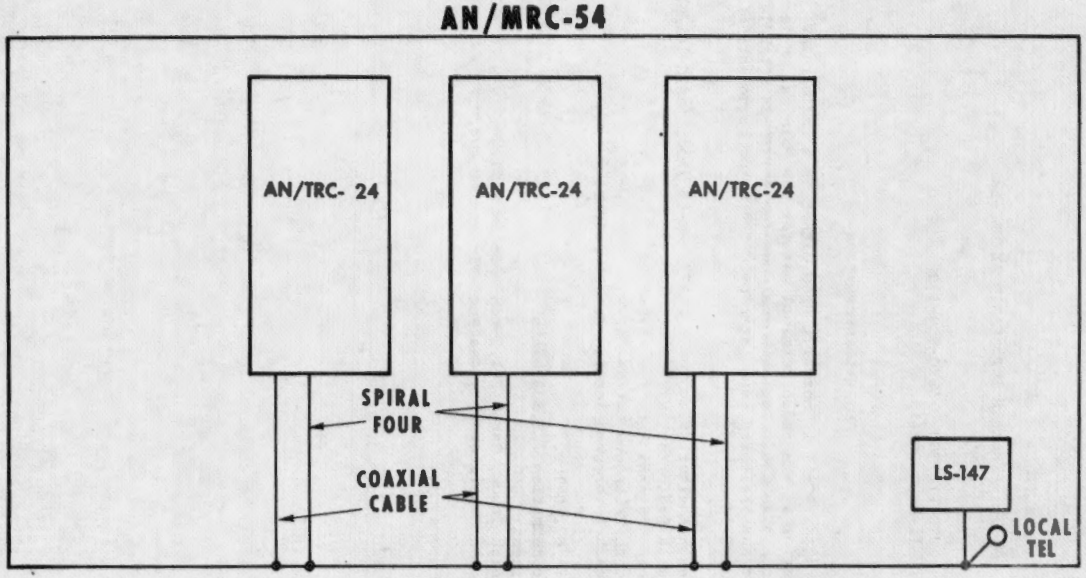
STATUS: STD-A; FSN: 5820-999-1796
REF: TM 11-5820-203-15

### GENERAL INFORMATION

The AN/MRC-54 is normally used either as a radio relay repeater or as the radio terminal set for one Terminal, Telegraph-Telephone AN/MCC-6. During normal use two AN/TRC-24's handle traffic and the third is on standby. The major components of the AN/MRC-54 are:

1 each Shelter, Elec Equip S-177/MRC-54 (modified S-141/G).
3 each Radio Set AN/TRC-24.
3 each Antenna Sets for AN/TRC-24.
1 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.

Weight: 6,210 lbs.
Power consumption: 5,303 watts.
MOCOM items:
1 each Truck, Cargo 2-1.2-ton M-35 or M-211.
1 each Generator Set, Gas Eng, Tlr Mtd PU-474/M.


AN/MRC-54
AN/TRC- 24
AN/TRC-24
AN/TRC-24
SPIRAL FOUR
COAXIAL CABLE
LS-147
LOCAL TEL

## RADIO TERMINAL SET AN/MRC-68A

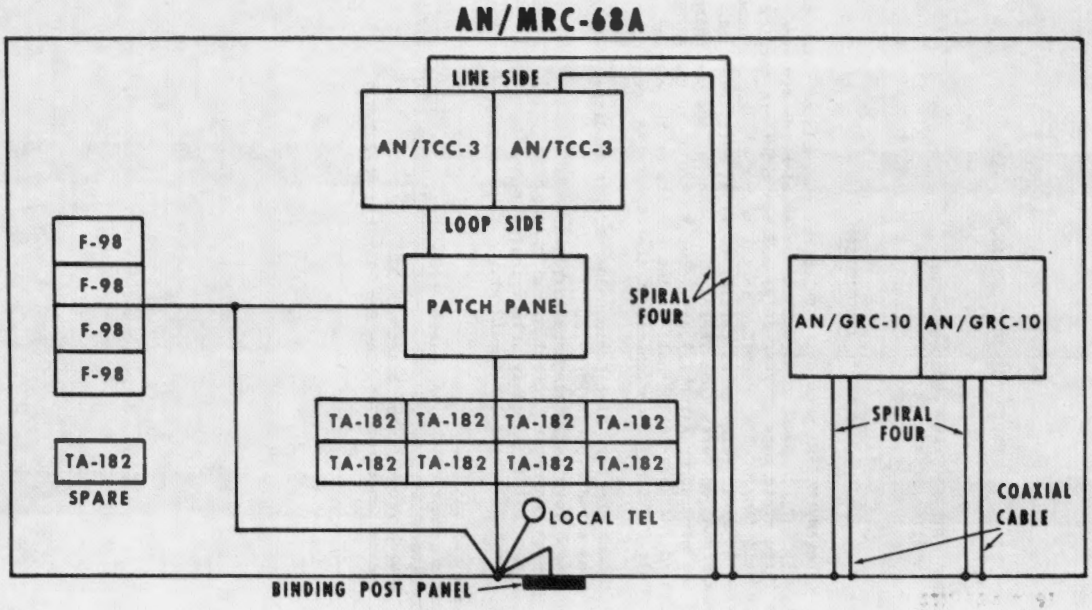
STATUS: STD-A; FSN: 5820-943-6507
REF: TM 11-5820-505-15

### GENERAL INFORMATION

The AN/MRC-68A provides 8 telephone channels of which 4 circuits may be speech-plus-duplex for an airborne division. The three radio sets (AN/GRC-10's) and two telephone carrier terminals (AN/TCC-3's) provided in the AN/MRC-68A can be used either as radio relay or as carrier terminal sets. The telephone signal converts (one TA-182/U per channel and one spare) and the band suppression filters (four F-98/U's) in the AN/MRC-68A are used for speech-plug-half-duplex service on the carrier channels. The major components of the AN/MRC-68A are:

1 each Shelter, Elec Equip S-304/MRC-68A (modified S-144/G).
3 each Radio Set AN/GRC-10.
2 each Terminal, Telephone AN/TCC-3.
9 each Converter, Tg-Tel Signal TA-182/U.
4 each Filter Assembly, Electrical F-98/U.
2 each Telephone Set TA-312/PT.

Weight: 1,750 lbs.
Power consumption: 2,980 watts.
MOCOM items:
1 each Truck, Cargo 3/4-ton M-37.
1 each Generator Set, Gas Eng, Tlr Mtd PU-322/G.


AN/MRC-68A
LINE SIDE
AN/TCC-3
AN/TCC-3
LOOP SIDE
F-98
F-98
F-98
F-98
PATCH PANEL
SPIRAL FOUR
AN/GRC-10
AN/GRC-10
TA-182
TA-182
TA-182
TA-182
TA-182
TA-182
TA-182
TA-182
SPIRAL FOUR
TA-182
SPARE
LOCAL TEL
COAXIAL CABLE
BINDING POST PANEL

## RADIO TERMINAL SET AN/MRC-69

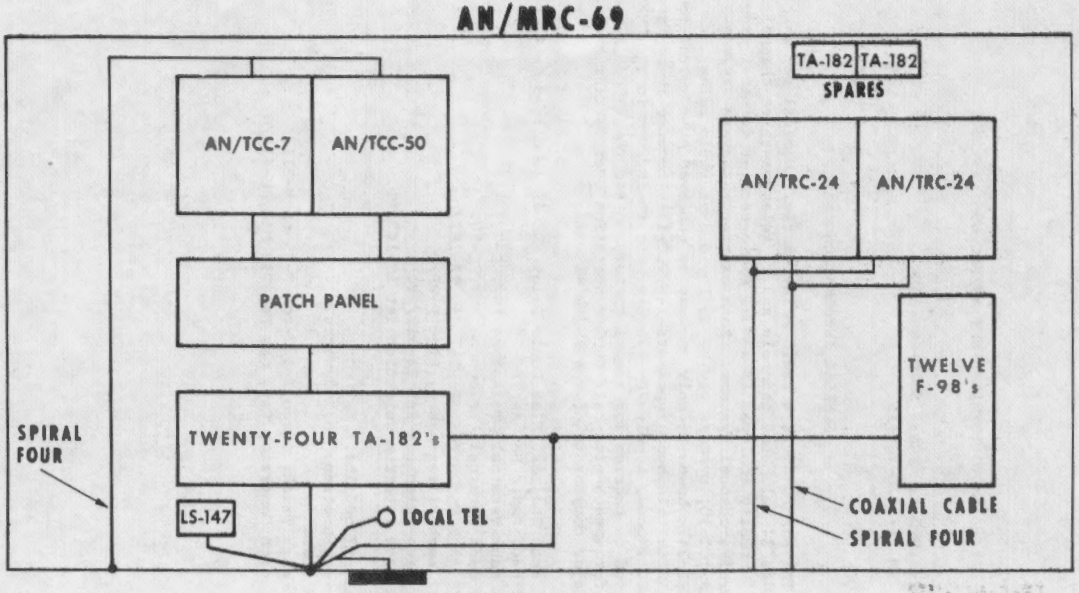
**STATUS: STD-A; FSN: 5820-889-3884**
**REF: TM 11-5820-204-15**

### GENERAL INFORMATION

The AN/MRC-69 is a radio relay carrier terminal set which provides 24 telephone channels and 12 teletypewriter channels. It is normally employed as a dual radio-carrier terminal providing two twelve-channel systems. Both carrier telephone (AN/TCC-7 and AN/TCC-50) systems may be employed over radio relay (AN/TRC-24); however, only one may be employed over spiral-four cable with telephone repeaters (AN/TCC-11), because there is only one 600 v power supply (PP-826/U). The TA-182/U's in the AN/MRC-69 are used on carrier for signal conversion and the F-98/U's are used for speech-plus-half-duplex operation over carrier channels. The major components of the AN/MRC-69 are:

1 each Shelter, Elec Equip S-189/MRC-69 (modified S-141/G).
2 each Radio Set AN/TRC-24.
1 each Terminal, Telephone AN/TCC-7.
1 each Terminal, Telephone AN/TCC-50.
26 each Converter, Tg-Tel Sig TA-182/U.
12 each Filter Assem, Elec F-98/U.
1 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.

**Weight:** 7,500 lbs.
**Power consumption:** 6,293 watts.
**MOCOM items:**
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.
1 each Generator Set, Gas Eng Tlr Mtd PU-474/M.


AN/MRC-69
TA-182
TA-182
SPARES
AN/TCC-7
AN/TCC-50
AN/TRC-24
AN/TRC-24
PATCH PANEL
TWELVE
F-98's
SPIRAL
FOUR
TWENTY-FOUR TA-182's
LS-147
LOCAL TEL
COAXIAL CABLE
SPIRAL FOUR

## RADIO TERMINAL SET AN/MRC-73

STATUS: STD-A; FSN: 5820-069-8912
REF: TM 11-5895-221-15

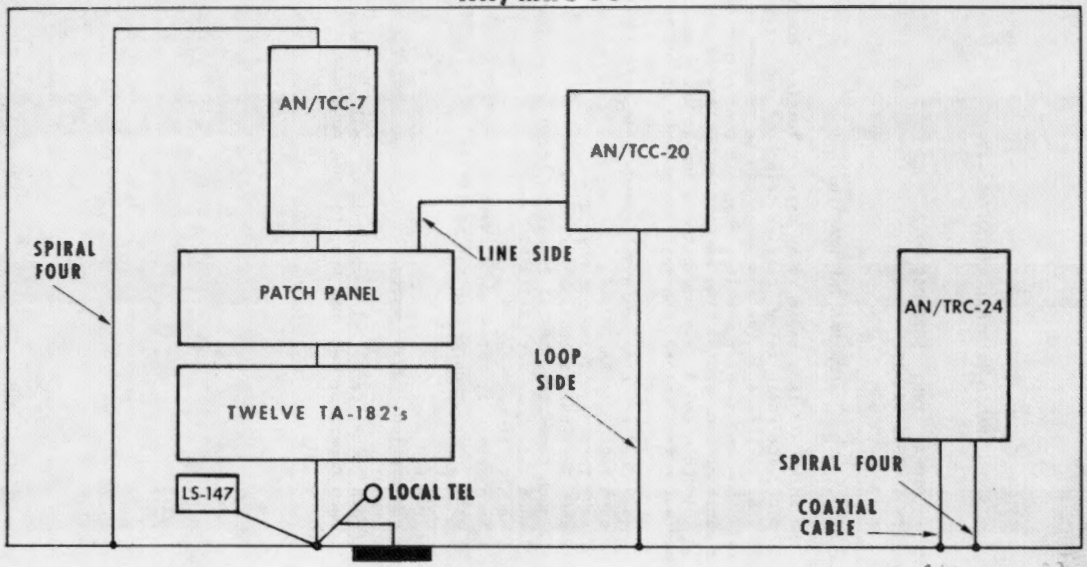
### GENERAL INFORMATION

The AN/MRC-73 is a radio relay carrier terminal configuration used to provide radio relay, carrier telephone and carrier teletypewriter facilities. The equipment can be arranged to provide 11 telephone and 4 teletypewriter channels over either spiral-four cable or over radio. The maximum capability of the AN/MRC-73 is 12 telephone and 4 teletypewriter channels using separate transmission facilities. The major components of the AN/MRC-73 are:

1 each Shelter, Elec Equip S-181/MRC-73 (modified S-141/G).
1 each Radio Set AN/TRC-24.
1 each Terminal, Telephone AN/TCC-7.
1 each Terminal, Telegraph AN/TCC-20.
12 each Converter, Tg-Tel Signal TA-182/U.
2 each Telephone Set TA-312/PT.
1 each Teletypewriter TT-4A/TG.
1 each Terminal, Telegraph TH-5/TG.
1 each Intercommunication Set LS-147/FI.

Weight: 4,617 lbs.
Power consumption: 4,397 watts.
MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.
1 each Generator Set, Gas Eng, Tlr Mtd PU-474/M.

# AN/MRC-73


AN/TCC-7
AN/TCC-20
SPIRAL FOUR
LINE SIDE
PATCH PANEL
AN/TRC-24
LOOP SIDE
TWELVE TA-182's
SPIRAL FOUR
LS-147
LOCAL TEL
COAXIAL CABLE

## RADIO TERMINAL SET AN/MRC-102

STATUS: STD-A; FSN: 5820-167-7935
REF: TM 11-5895-357-14

### GENERAL INFORMATION

The AN/MRC-102 is a radio-carrier assemblage used to provide radio relay, carrier telephone, and carrier telegraph facilities in an area-type communications system. It has the same capabilities as, and may be used in place of, the AN/MRC-73. The major components of the AN/MRC-102 are:

1 each Shelter, Elec Equip S-306/MRC-102 (modified S-141/G).
2 each Radio Set AN/GRC-50.
1 each Terminal, Telephone AN/TCC-7.
1 each Terminal, Telegraph AN/TCC-20.
12 each Converter, Tg-Tel Signal TA-182/U.
1 each Telephone Set TA-312/PT.
1 each Teletypewriter TT-4A/TG.
1 each Terminal, Telegraph TH-5/TG.
1 each Intercommunication Set LS-147/FI.

Weight: 4,617 lbs.
Power consumption: 5,452 watts.
MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211
1 each Generator Set, Gas Eng, Tlr Mtd PU-474/M.

## RADIO REPEATER SET AN/MRC-103(V)

STATUS: STD-A; FSN: 5820-788-5267
REF: TM 11-5820-533-14

### GENERAL INFORMATION

The AN/MRC-103(V) is normally used either as a radio relay repeater or as the radio terminal set for one Terminal, Telegraph-Telephone AN/MCC-6. During normal use two AN/GRC-50's handle traffic and the third is on standby. The major components of the AN/MRC-103(V) are:

1 each Shelter, Elec Equip S-307/MRC-103 (modified S-141/G).
3 each Radio Set AN/GRC-50.
3 each Antenna sets for AN/GRC-50.
1 each Telephone Set TA-312/PT.
1 each Intercommunication Set LS-147/FI.

Weight: 3,600 lbs.
Power consumption: 5,340 watts.
MOCOM items:
1 each Truck, Cargo 2-1/2-ton M-35 or M-211.
1 each Generator Set, Gas Eng, Tlr Mtd PU-474/M.

LOW CAPACITY SYSTEMS
ASSEMBLAGE DESCRIPTION AND EMPLOYMENT

| Type No. | Vehicle | Description | Major electronic components: Radio Set AN/GRC-103 | Multiplexer TD-660 | Cable Comb TD-754 | Converter CV-1548 | Key Gen KG-27 | Primary employment |
|---|---|---|---|---|---|---|---|---|
| AN/MRC-126 | 1/4-ton trailer | Radio Terminal Set (single 12-chan) | 1 | 1 | 1[b] | 1 | 1[b] | Combined radio and multiplex terminal used in forward areas of air defense artillery. |
| AN/MRC-115 | 1/4-ton trailer | Radio Terminal Set (dual 12-chan) | 2 | 2 | | 2 | | Interim assemblage for terminal and repeater application in forward areas of infantry, mechanized, armored, airmobile and airborne divisions. |
| AN/MRC-127 | 1/4-ton trailer | Radio Terminal Set (dual 12-chan) | 2 | 2 | 2[b] | 2 | 2[b] | Combined radio and multiplex terminal in airborne and airmobile divisions. |
| AN/MRC-129 | 12-1/2-ton armored | Radio Terminal Set (dual 12-chan) | 2[a] | 2 | 2[b] | 2 | 2[b] | Combined radio and multiplex terminal used by signal battalions in forward areas of armored and mechanized divisions. |
| AN/TRC-145 | 1-1/4-ton truck | Radio Terminal Set (dual 12-chan) | 2 | 2 | 2 | 2 | 2[b] | Combined radio and multiplex terminal in infantry, armored and mechanized division or tactical field army units. |
| AN/TCC-65 | 1-1/4-ton truck | Telephone Terminal (quad 12-chan) | | 4 | 4 | 4 | 4[b] | Split terminal with AN/TRC-113 in infantry, armored and mechanized divisions. |

| Type No. | Vehicle | Description | Major electronic components | | | | | Primary employment |
|---|---|---|---|---|---|---|---|---|
| | | | Radio Set AN/GRC-103 | Multiplexer TD-660 | Cable Comb TD-754 | Converter CV-1548 | Key Gen KG-27 | |
| AN/TRC-113 | 1-1/4-ton trailer | Radio Repeater Set (12-chan) | 3 | | 3 | | | Radio repeater or split terminal with AN/TCC-65 in infantry, armored and mechanized division. |

[a]Also uses one (1) each Radio Set AN/VRC-49, for alignment and in-transit communication.
[b]Contains facility for optional use, when required.

## MEDIUM CAPACITY SYSTEMS
## ASSEMBLAGE DESCRIPTION AND EMPLOYMENT

| Type No. | Vehicle | Description | Major electronic components | | | | | | Primary employment |
|---|---|---|---|---|---|---|---|---|---|
| | | | Radio Set AN/GRC-50 | Multiplexer TD-352 | Radio Comb TD-202 | Cab Comb TD-204 | Converter CV-1548 | Key Gen KG-27 | |
| AN/TRC-108 | 3/4-ton truck | Radio Terminal Set (12-chan) | 1 | 1 | 1 | | 1 | 1 | Airborne corps; corps artillery system. |
| AN/TRC-143 | 1-1/4-ton truck | Radio Terminal Set (12-chan) | 1 | 1 | 1 | | 1 | 1 | Airborne corps; corps artillery system. |
| AN/TRC-117 | 2-1/2-ton truck | Radio Terminal Set (dual 12- or single 24-chan system) | 2 | 2 | 2 | 2 | 2 | 2 | Corps and army command system as single unit terminal (distant terminal with subordinate units). |
| AN/TCC-60 | 3/4-ton truck | Telephone Terminal (dual 12-chan or single 24-chan) | | 2 | | 2 | 2 | 2 | Corps and army command system as split terminal with AN TRC-110; army area for cable system into major headquarters. |
| AN/TCC-69 | 1-1/4-ton truck | Telephone Terminal (dual 12-chan or single 24-chan) | | 2 | | 2 | 2 | 2 | Corps and army command system as split terminal with AN TRC-110; army area for cable system into major headquarters. |
| AN/TCC-61 | 2-1/2-ton truck | Telephone Terminal (8 groups of 12-chan) | | 8 | | 8 | 8 | 8 | Corps and army command system as split terminal with AN TRC-110 (also used in tropo-scatter system). |

MEDIUM CAPACITY SYSTEMS (Cont)
ASSEMBLAGE DESCRIPTION AND EMPLOYMENT

| Type No. | Vehicle | Description | Major electronic components | | | | | | Primary employment |
|---|---|---|---|---|---|---|---|---|---|
| | | | Radio Set AN/GRC-50 | Multiplexer TD-352 | Radio Comb TD-202 | Cab Comb TD-204 | Converter CV-1548 | Key Gen KG-27 | |
| AN/TRC-109 | 3/4-ton truck | Radio Repeater Set (12-24-chan) | 2 | | 2 | 2 | | | Airborne corps repeater or as a split terminal with AN/TCC-60, -69. |
| AN/TRC-110 | 2-1/2-ton truck | Radio Repeater Set (12-24 chan) | 3 | | 3 | 3 | | | Corps and army command system as repeater and as split terminal with AN/TCC-60, -69, or -61. |

## HIGH CAPACITY SYSTEMS
## ASSEMBLAGE DESCRIPTION AND EMPLOYMENT

| Type No. | Vehicle | Description | Major electronic components | | | | | | | | | | Primary employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Radio Set AN/GRC-50 | Radio Set AN/GRC-144 | Multiplexer TD-660 | Multiplexer TD-353 | Radio Comb TD-202 | Cab Comb TD-754 | Cab Comb TD-204 | Converter CV-1548 | Key Gen KG-27 | | |
| AN/TRC-151 | 1-1/4-ton truck | Radio Terminal Set (12-24-chan) | 2 | | 2 | | 2 | 2 | | 2 | 2 | | Dual 12-24-chan combined radio multiplex terminal. |
| AN/TCC-72 | 1-1/4-ton truck | Telephone Terminal | | | 2 | | | 2 | | 2 | 2 | | Dual 12-chan telephone multiplex terminal. Provides terminal multiplex equipment for 2 telephone carrier systems and can be employed over radio or cable facilities. May be used with AN/TCC-65, AN/TRC-152, AN/TRC-151 or employed to provide a single 24-channel cable system. |
| AN/TCC-65 | 1-1/4-ton truck | Telephone Terminal | | | 4 | | | 4 | | 4 | 4 | | Provides terminal multiplex equipment for 4 telephone carrier systems which can have either a 6- or 12-chan capacity and can be employed over either radio or cable facilities. Normally used with Radio Repeater AN/TRC-152. |
| AN/TCC-62 | 2-1/2-ton truck | Telephone Terminal (dual 48- or single 96-chan) | | | | 2 | | | 2 | 8 | | | Telephone multiplex terminal assemblage. It provides terminal multiplex equipment for two 48-chan systems and can be employed over either radio or cable facilities. |

MAJOR ELECTRONIC COMPONENTS

| TYPE NO | VEHICLE | DESCRIPTION | RADIO SET AN/GRC-147 | RADIO SET AN/GRC-50 | RADIO SET AN/GRC-144 | MULTIPLEXER TD-660 | MULTIPLEXER TD-353 | RADIO COMB TD-202 | CAB COMB TD-754 | CAB COMB TD-204 | CONVERTER CV-1548 | KEY GEN KG-27 | PRIMARY EMPLOYMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/TRC-152 | 2-1/2 TON TRUCK | RADIO RPTR SET | | 3 | | | | 3 | 3 | | | | PROVIDES FOR REPEATER CAPABILITY OR TERMINAL CAPABILITY WITH MULTIPLEXER SUCH AS THE AN/TCC-65 OR AN/TCC-72. |
| AN/TRC-138 | 2-1/2 TON TRUCK | RADIO RPTR SET | | 3[a] | | | | | | | | | PROVIDES FACILITIES FOR REPEATER CAPABILITY OR TERMINAL CAPABILITY WITH PROVISION FOR TERMINATING 3 SYS (48 CHAN SYS) USED WITH AN/TCC-62. |
| AN/TRC-111 | 2-1/2 TON TRUCK | RADIO RPTR SET | 1 | | | | | | | 6 | | | SAME AS ABOVE |

a. RADIO SET AN/GRC-144 HAS BUILT-IN RADIO COMBINER AND CABLE COMBINER.

TERMINAL SET, TELEPHONE
AN/TCC-73(V)

STATUS: STD-A; FSN: 5805-134-5404
REF: TM 11-5805-585-14

GENERAL INFORMATION

The AN/TCC-73 is an air- or vehicular-transportable assemblage used to provide secure or non-secure multiplex terminal or repeater facilities for an Army-area communications systems utilizing pulse code modulation (pcm). Although the AN/TCC-73 is primarily a cable terminal, it may be used with other equipment such as Radio Terminal Set AN/TRC-121, Radio Repeater Set AN/TRC-111, and Radio Repeater Set AN/TRC-138 for radio terminal applications. The eight equipment sets of the AN/TCC-73 may be for use as a terminal, a repeater, or a combination of both capabilities. The major components of the AN/TCC-73 are:

1 each Shelter Elec Equip S-419/TCC-73.
8 each Converter, Telephone Sig CU-1548/G.
4 each Multiplexer TD-204/U.
4 each Multiplexer TD-754/G.
8 each Multiplexer TD-660/G.
1 each Telephone Set TA-312/PT.
8 each Comm Security Equip TSEC/KG-27.

Note: KG-27 required for secure operation but not supplied as part of shelter.

TECHNICAL CHARACTERISTICS

Input voltage: 115 v, 50-60 Hz single phase.
Number of channels per system: 12.
Pulse type: Binary dipulse.
Frequency response: 300-1,700 Hz.
Signaling frequency: 1,600 Hz.

TROPOSPHERIC PCM
ASSEMBLAGE DESCRIPTION AND EMPLOYMENT

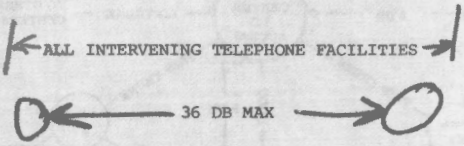
| Type No. | Vehicle | Description | Major electronic components | | | Primary employment |
|---|---|---|---|---|---|---|
| | | | Radio Set AN/GRC-143 | Converter CV-425 | Radio Set AN/GRC-106 | |
| AN/TRC-112 | 2 ea 1-1/4-ton truck | Radio Terminal Set (24-chan) | 1 | 1 | 1[a] | Split terminal in army and corps command system with AN/TCC-60, -69 or AN/TCC-61. |
| AN/TRC-121 | 2 ea 2-1/2-ton truck | Radio Terminal Set (2 ea 24-chan) | 2 | 2 | 1[a] | Split terminal in army and corps command system with AN/TCC-60, -69 or AN/TCC-61. |

[a]Ancillary equipment (included for alignment of tropo).

## APPENDIX A. THE MILITARY TRANSMISSION PLAN (TELEPHONE)

### INTRODUCTION

To insure that a conversation between two telephones will be satisfactory, the loss in circuits linking telephones must be low enough for the speech to be heard and understood. The military transmission plan provides an orderly method of allocating losses in the various circuits in any communications network, and insures satisfactory intercommunication between any two points in a network. With present-day military telephones, the maximum allowable loss of the overall circuit between two or more telephones should not exceed 36 db.



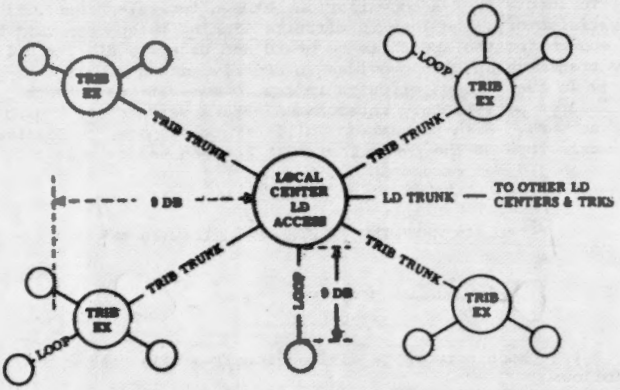

A telephone network is divided into two main categories as follows:

1. A local area network, which serves subscribers through a system of loops, tributary exchanges, and tributary and terminal trunks, and provides one switching center with long distance access to distant local area networks.

2. A long distance (LD) network which includes LD trunks and switching centers, and provides interconnection between the local area-networks.

LOCAL AREA NETWORK

The maximum allowable loss (loop loss plus tributary trunk loss) for subscribers requiring access to the long distance network is 9 db. This loss is called the "tributary loss."



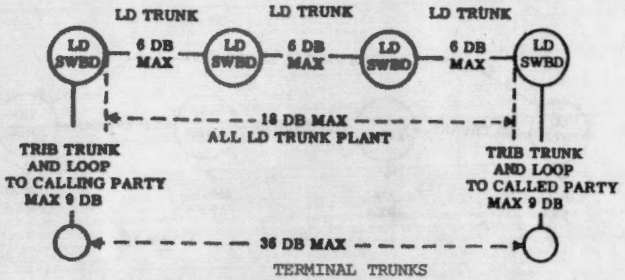

Note: In certain cases, a tributary exchange may not have a direct trunk group to a long-distance or local center, and must complete long distance calls by way of an intervening tributary exchange. Of the allowable 9 db tributary loss, no more than 6 db should be used by the tributary trunks in tandem, which allows at least a 3 db loss to the loop plant. Thus, two important elements in planning the circuit layout of the local network are:

1. No more than two tributary trunks should be switched in tandem.

2. Always allow at least 3 db loss for loop planning in the tributary area.

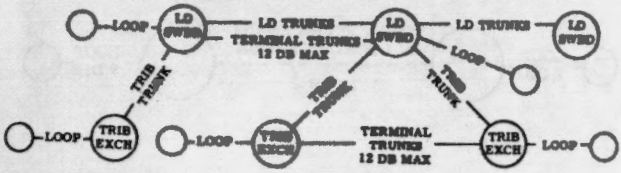
## LONG DISTANCE NETWORK

To provide a circuit path for a call originating in one local network area to a called party in a distant local network area may require interconnection of several LD trunks in tandem. The nominal loss of one LD grade trunk is 3 db from switchboard to switchboard. In certain cases, the maximum allowable loss may be increased to 6 db per LD trunk. The total allowable loss for all the long distance trunk plant in a built-up connection is 18 db.



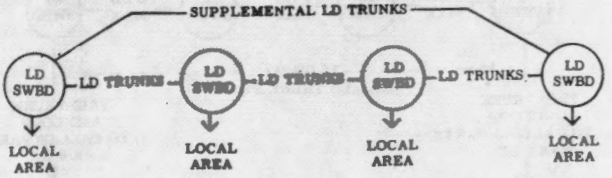

TERMINAL TRUNKS

Terminal grade trunks may have a maximum loss of 12 db and are used to provide for high volume traffic either between the exchanges or areas where the trunks terminate. Terminal trunks may be connected to loops or tributary trunks, but never to LD trunks or to other terminal trunks.



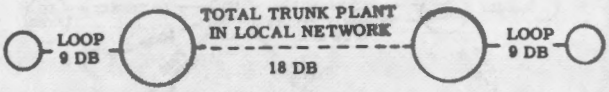
## SUPPLEMENTAL TRUNKS

Supplemental trunks are used to interconnect widely separated LD switching centers and by-pass intermediate switching points. Supplemental trunks permit the completion of very long distance calls without interconnecting an excessive number of LD trunks, and can be switched to loops, tributary trunks or LD trunks.



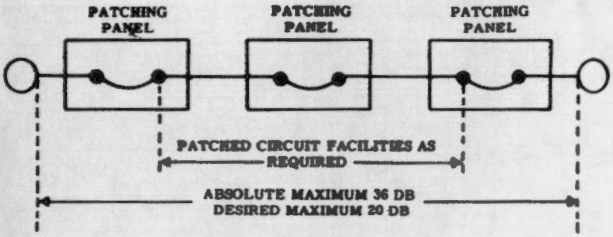

## SPECIAL CIRCUITS

The maximum allowable loss for loops which do not require access to long distance networks, but do require switching within the local network, is 9 db.



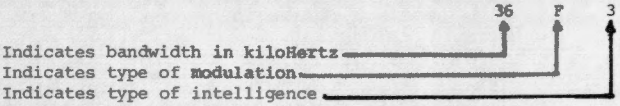
The maximum allowable loss in loops connected only to other loops is 18 db.


For direct, patched, private-line or user-to-user circuits, the loss should be a maximum of 20 db; however, if necessary, losses can be as high as 36 db.



APPENDIX B. TYPES OF SERVICE AND OPERATION EXPLAINED

1. Types of Service:




Types of Service Indicators:

| Modulation | Intelligence (partial listing) |
|---|---|
| A - Amplitude | 0 - None (straight carrier only) |
| F - Frequency or phase | 1 - Telegraphy (CW, FSK, NSK) |
| P - Pulse | 2 - Modulated CW (MCW) |
| | 3 - Telephone (voice) |
| | 3a - Single sideband, reduced carrier |
| | 3b - Two independent sidebands, reduced carrier |
| | 3h - Single sideband, full carrier |
| | 3j - Single sideband, suppressed carrier |
| | 4 - Facsimile |
| | 5 - Television |
| | 9 - Composite, or not otherwise covered |

2. Types of Operation:

a. Duplex, full duplex or FDX: Simultaneous operation in opposite directions. Transmitting and receiving over two frequencies.

b. One half duplex, half duplex or HDX: Operation of a duplex system arranged to permit operation in either direction but not in both directions simultaneously.

c. One way reversible: Operation in one direction at a time, but reversible, without a break capability. Utilizes one frequency.

## APPENDIX C. STANDARDIZATION TYPE CLASSIFICATIONS

Standard A (STD-A)

The most advanced and satisfactory items currently available to fill operational requirements.

Standard B (STD-B)

Items which have limited acceptability to fill operational requirements. These items are normally used and issued as substitutes for Standard A items.

Standard C (STD-C)

Items which have only marginal acceptability for operating requirements, and are being forced out of the system as stocks of more acceptable items become adequate to meet requirements.

Limited Standard (LS)

Items which are not acceptable for United States Army operational requirements and will not, therefore, be counted as assets against operational requirements.

Obsolete (OBS)

Items which are no longer acceptable for United States Army use.

Developmental (Dev)

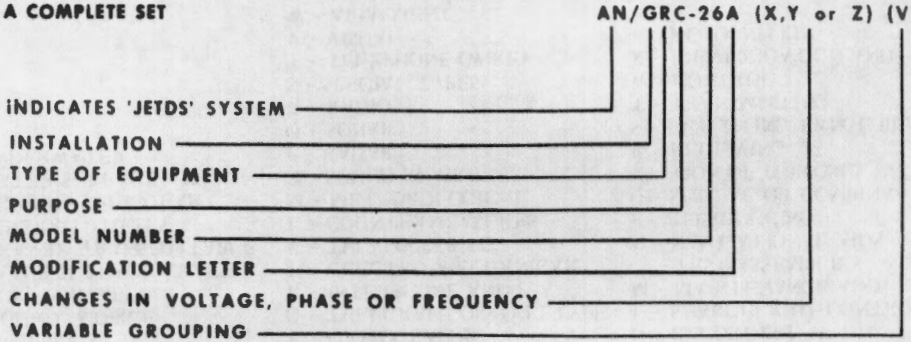
Material being developed or tested to meet approved qualitative material requirements or small development requirements.

Limited Production (LP)

An item under development, commercially available or available from other government agencies for which an urgent operational requirement exists and for which no other existing item is adequate.

# APPENDIX D. THE JOINT ELECTRONICS DESIGNATION SYSTEM (JETDS)

1. A COMPLETE SET




2. SAMPLE OF A COMPONENT USED WITH APATICULAR SET: C-808/GRC-26A

3. SAMPLES OF A COMPONENT NOT USED WITH A PARTICULAR SET: S-69/GRC

## 4. TABLE OF SET OR EQUIPMENT INDICATOR LETTERS

| INSTALLATION | TYPE OF EQUIPMENT | PURPOSE |
|---|---|---|
| A - AIRBORNE | A - INVISIBLE LIGHT, HEAT RADIATION | A - AUXILIARY ASSEMBLIES |
| B - UNDERWATER | B - PIGEON | B - BOMBING |
| C - AIR TRANSPORTABLE | C - CARRIER | C - COMMUNICATIONS |
| D - PILOTLESS CARRIER | D - RADIAC | D - DIRECTION FINDING |
| F - FIXED | E - NUPAC | E - EJECTION/RELEASE |
| G - GROUND, GENERAL | F - PHOTOGRAPHIC | G - FIRE CONTROL |
| K - AMPHIBIOUS | G - TELEGRAPH OR TELETYPE | H - RECORDING |
| M - GROUND, MOBILE | I - INTERPHONE AND P. A. | L - SEARCHLIGHT CONTROL |
| P - PACK, PORTABLE | J - ELECTRO-MECHANICAL | M - MAINTENANCE AND TEST ASSEMBLIES |
| S - WATER SURFACE CRAFT | K - TELEMETERING | N - NAVIGATIONAL AIDS |
| T - GROUND, TRANSPORTABLE | L - COUNTERMEASURES | P - REPRODUCING |
| U - GENERAL UTILITY | M - METEOROLOGICAL | Q - SPECIAL OR COMBINATION OF PURPOSES |
| V - GROUND, VEHICULAR | N - SOUND IN AIR | R - RECEIVING |
| W - WATER, SURFACE AND UNDERWATER | P - RADAR | S - DETECTING, RANGE BEARING |
| | Q - SONAR | T - TRANSMITTING |
| | R - RADIO | W - CONTROL |
| | S - SPECIAL TYPES | X - IDENTIFICATION AND RECOGNITION |
| | T - TELEPHONE (WIRE) | |
| | V - VISUAL | |
| | W - ARMAMENT | |
| | X - FAX OR TV | |
| | Y - DATA PROCESSING | |

# APPENDIX E. TRANSMISSION DATA FOR FIELD WIRE AND CABLE

| Type | Loading[a] | Dc resistance (ohms per loop mile) | Capacitance (mf per mile) | 1kHz impedance (ohms) | Approximate attenuation (db per mile) at 70° F | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1kHz | 3kHz | 6kHz | 7kHz | 12kHz | 20kHz | 28kHz | 30kHz | 40kHz | 60kHz | 68kHz | 73kHz |
| Insulated wires and cables | | | | | | | | | | | | | | | | |
| WD-1 or WD-14 dry[b] | nonloaded | 230 | 0.051 | 618-j580 | 1.6 | 2.7 | 3.5 | 4.3 | 4.4 | 5.0 | 5.3 | 5.4 | 5.7 | 6.3 | 6.7 | 7.9 |
| WD-1 or WD-14 wet[b] | nonloaded | 230 | 0.122 | 399-j377 | 2.5 | 4.2 | 5.5 | 6.7 | 6.9 | 7.8 | 8.3 | 8.5 | 9.0 | 10.0 | 10.7 | 11.1 |
| CX-4566 | nonloaded | 325 | 0.090 | 545-j545 | 2.5 | — | — | — | — | — | — | — | — | — | — | — |
| CX-162 | nonloaded | 92 | 0.14 | 256-j233 | 1.6 | 2.6 | 3.3 | 3.9 | 4.0 | 4.6 | 5.3 | 5.5 | — | — | — | — |
| CX-1065 | nonloaded | 87 | 0.083 | 310-j283 | 1.3 | 2.0 | 2.5 | 2.8 | 2.82 | 3.0 | 3.16 | 3.2 | 3.4 | 3.9 | 4.0 | — |
| CX-1065 | 1320-6 | 93 | 0.083 | 569-j130 | 0.73 | 0.76 | 0.77 | 0.785 | 0.79 | 0.88 | — | — | — | — | — | — |

[a]The type of loading is specified by a number representing the wire distance in feet between loading coils followed by a number giving the inductance of the loading coil in millihenries.

[b]Dry figures can be used in areas with less than 10 inches of rainfall annually, distributed throughout the year. In all other cases, use wet weather figures.

[c]For loaded circuits in CX-1065 spiral-four cable, value for the 1,000-Hertz impedance is shown for full-coil termination.

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