

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,

AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)1 (NSN 5895-00-949-5868)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)2 (NSN 5895-00-949-5906)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)3 (NSN 5895-00-948-5606)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)4 (NSN 5895-00-948-5642)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)5 (NSN 5895-00-949-5900)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)6 (NSN 5895-00-948-6410)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)7 (NSN 5895-00-948-5689)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)8 (NSN 5895-00-948-5680)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)9 (NSN 5895-00-930-2643)

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)10 (NSN 5895-00-949-5902)

AND

SWITCHING SET, COMMUNICATIONS AN/MSQ-74(V)12

(CONSOLE REMOTE EQUIPMENT) (NUS 7640)

HEADQUARTERS, DEPARTMENT OF THE ARMY

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CHAPTER 1

INTRODUCTION AND DESCRIPTION

SECTION I. GENERAL

1-1. Scope of Manual

This manual provides information pertaining to the installation, operation and maintenance of the Console Remote Equipment (CRE) of the ET-A Console System. The organization and level of the manual are described in the preface which appears at the front of each bound part.

1-2. Purpose and Use

a. CRE's are located along the main lines of the ET-A and EMT communications networks, and act as distribution links between tributary terminal sets and the rest of the system. The functions of the CRE are automatic, and are controlled by the Console Local Equipments (CLE), and by signals from the tributaries assigned to each CRE.

b. Each CRE may service up to 24 tributary terminal sets.

(1) At ET-A sites, the CRE services three sectors of up to eight tributaries each. Each sector is assigned two audio channels so that the tributaries assigned to that sector may be connected to either of two conferences.

(2) At EMT sites, the CRE may service up to 24 individual tributaries.

c. The CRE receives commands from the CLE in control of the system, decodes the messages, performs connect and disconnect operations pertaining to its tributaries, and routes other instructions to the tributaries affected. In addition, each CRE receives status data from its tributaries, inserts this data into a message format, and routes it into the system and to the CLE for status display.

d. Five four-wire trunks are routed through the CRE from the ET-A communication system. These trunks are bridged in each CRE to access the CRE to the mainline without interrupting service. One trunk is used as a supervisory circuit for command and status signaling, and the other four are used as conference trunks. One of the four conference trunks, designated as a ready circuit, is constantly checked out. The ready circuit is then used to establish the next conference, and the next trunk in order becomes the ready circuit. Any conference to be initiated must be assigned on the ready circuit.

SECTION II. DESCRIPTION AND LEADING PARTICULARS

1-3. General Description

a. The Console Remote Equipment (CRE) is housed in a single modified M-348A2 van (fig. 1-1). Figure 5-1 illustrates the position of the units comprising the CRE together with the physical characteristics of the van. Four elevation (vertical) views are included which depict the appearance of the equipment as viewed from four different points within the van.

b. Three identical air conditioners (units 28, 29 and 30; fig. 5-1, items 18) are included in the van, and provide cooling or heating as required, to maintain favorable temperature conditions. The forced air is routed through three air ducts (fig. 5-1, item 19) which terminate above units 12, 23, and 24 (fig. 5-1, items 10, 13 and 14, respectively), directing the air out into the central area of the van. Dual intake fans (fig. 5-1, item 21) are provided for ventilating the van when the air conditioners are not in use.

c. Four primary ac power cables from external generators are brought into the van by means of a connector panel (fig. 5-1, item 16). The power is then routed through line filters to four circuit breaker and distribution boxes. Signal cables to/from external MUX equipment are connected to the van at a signal distribution panel in the van wall. This panel, in turn, feeds the distribution frame (fig. 5-1, item 15) inside the van. Signal and power cables interconnecting the units within the van are run just beneath the ceiling on overhead cable trays (fig. 5-1, item 20) and along portions of the frame.

d. All major units in the CRE are given unit numbers, as shown in figure 5-1. The van itself, including the signal distribution frame, is designated unit 1. Note that there are no units designated 2, 3, or 14 through 22. The remaining units are discussed in the following paragraphs.

1-4. Logic Equipment

a. The logic equipment is housed in cabinets or bays designated units 4 through 9 (fig. 5-1, items 2 through 7). The logic circuits in these units are fabricated on plug-in printed-circuit cards which can be inserted and removed from the front of the cabinets. A typical logic card is shown in figure 1-2. Each card is approximately four by six inches in size and contains an ejector handle riveted to the front end of the card to aid in removing and inserting the card. To unplug and remove a card, the bottom of the handle is pushed upward. The handles are color coded white and red, corresponding to colored strips above the slots in which the cards are mounted to prevent damage that might occur if a card were inserted into wrong slot. Each card contains test point jacks, numbered J1 through J14, mounted near the forward edge of the card so that readings can be taken under operating conditions while the card is electrically connected to its associated circuits. The plug connector for each card is fastened to its rear edge. The cards are mounted in individual nylon slots; there are 27 slots to a row, two rows (54 slots) to a nest, and six nests (324 slots) to a cabinet.

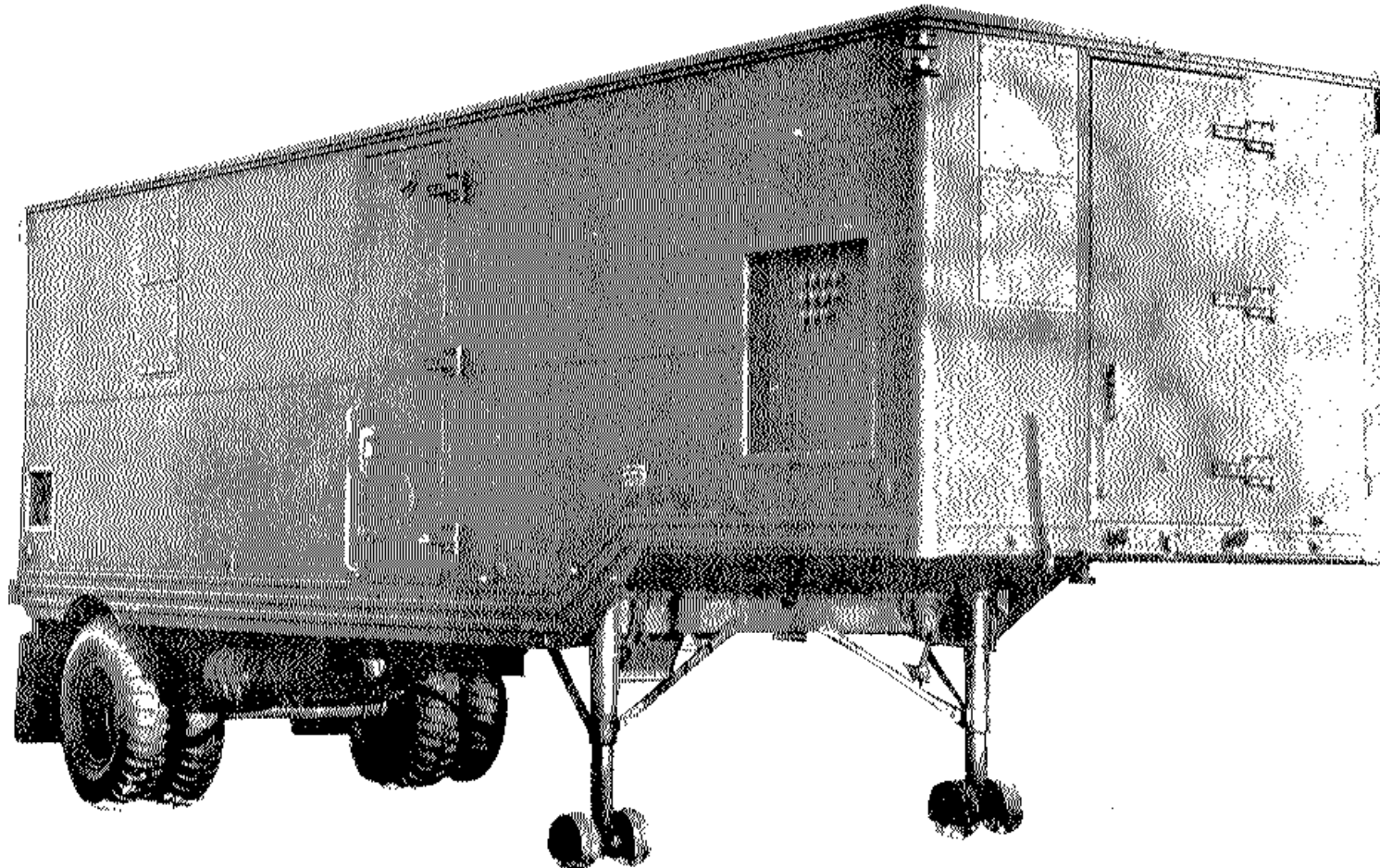


Figure 1-1. Console remote equipment van.

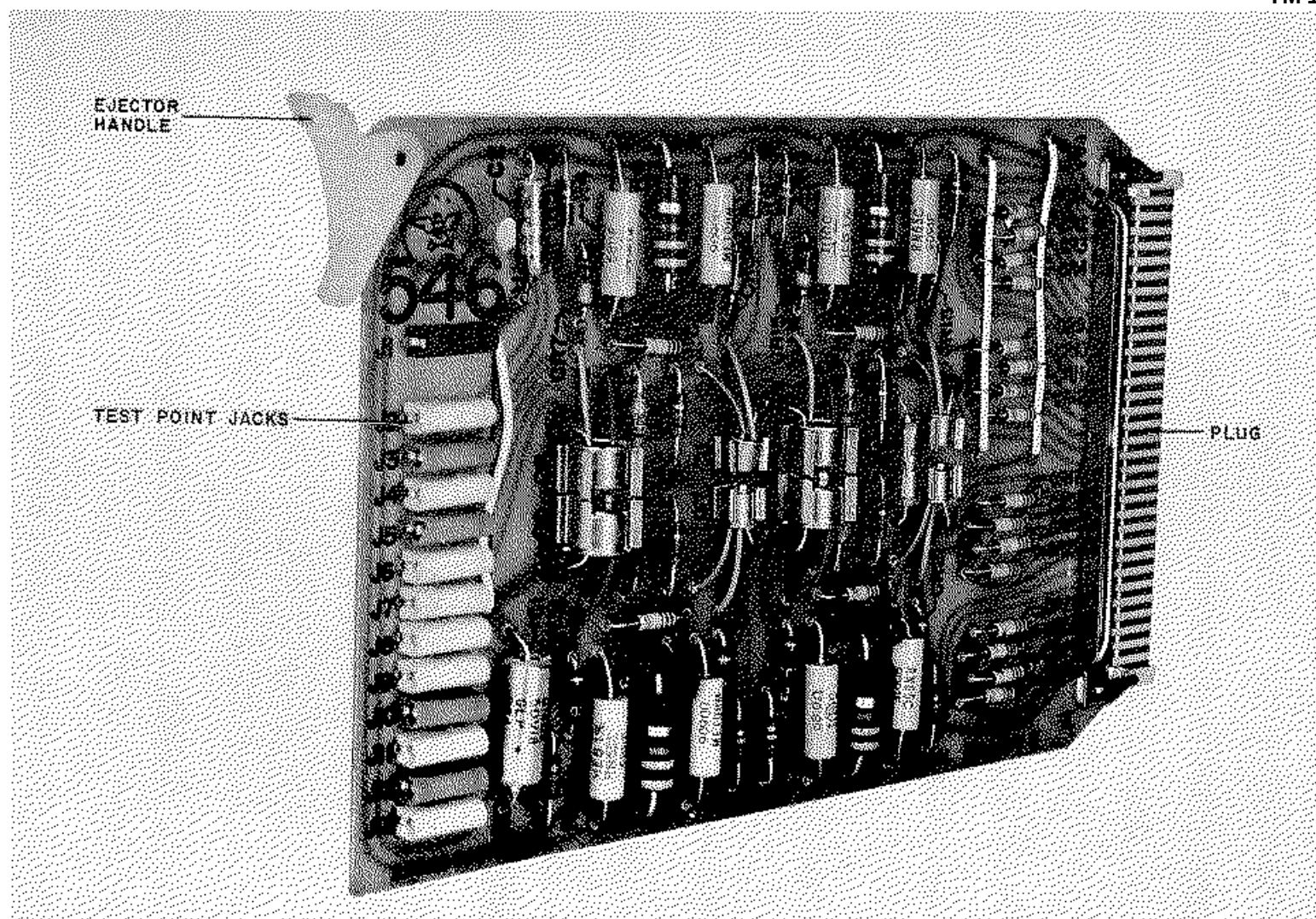


Figure 1-2. Typical logic card.

b. A typical logic cabinet or bay, illustrated in figure 1-3, is approximately 20 inches wide, 62 inches high, and seven inches deep, and can house up to 324 logic cards. The bay houses six logic card nests designated A2 through A7. Each nest, housing up to 54 logic cards, is approximately 10 inches high, 19 inches wide, and eight inches deep. The nests are mounted in standard 59-inch rack panels. The slot position, color code, and type number identifying each card in a nest are printed on the black panel strips that separate the nests. The rear of each nest contains the 33-pin connectors into which the logic cards are plugged.

c. Each logic bay contains LOGIC FAULT and POWER FAULT indicators located on a narrow panel at the top front of the cabinet. The LOGIC FAULT indicator lights red whenever an error is disclosed by fault detection circuits within the logic cabinet. The POWER FAULT indicator lights red when an overload exists on any of the dc input lines to the bay.

d. Level A1 of each logic bay contains the dc circuit breakers for that bay. These breakers open in the event of an overload on any of the dc lines.

e. Each bay can be swung out from the main supporting structure to expose the nest wiring and the signal cables (fig. 1-4). A mechanical stop prevents the bay from opening too far, and a locking mechanism keeps the bay from moving once it is open. The signal connector panel is at the top rear of the bay. A dc power bus, with taps for each logic card row, runs vertically along the right side of each cabinet, as viewed from the rear. A 1-volt ac transformer and associated receptacle are mounted on the supporting frame in back of each logic bay. These transformers provide filament voltage for the indicator lamps used on some of the logic cards.

f. Figure 1-5 illustrates unit 4 which contains the remote command receive (RCR) circuits. These circuits receive, decode, monitor, and temporarily store the supervisory command messages sent from the Console Local Equipment (CLE). Level A2/A3 contains three diode patch fields used to establish tributary and preset conference addresses together with the tributary preset conference assignments. Level A4 contains RCR patchfield circuitry, and levels A5 and A6 contain RCR receive, decode, and storage circuitry. Level A7 is blank.

g. Figure 1-6 shows a typical tributary control cabinet. There are three identical cabinets, units 5, 6, and 7, each containing the remote tributary group (RTG) and remote tributary single (RTS) logic functions for one sector of up to eight tributaries. One RTG circuit is common to a group of eight tributaries while each RTS circuit services one tributary. The function of the RTG and RTS circuits is to assemble and send digital command information to the proper tributaries. These circuits also receive and process digital status information from their respective tributaries. Levels A2 and A3 of each tributary control cabinet house the RTG circuitry for a particular sector, and levels A4 through A7 contain the RTS circuitry for that sector. The RTS circuits are packaged one row of logic cards per tributary. Level A8, located at the rear of each cabinet, is a terminal board which permits disabling alarm circuits associated with unused RTS circuits.

h. Figure 1-7 shows the trunk matrix control cabinet, unit 8, which contains the trunk matrix control (TMC) and the remote tributary common (RTC) logic circuits. The TMC circuits control the operation of the trunk matrix which makes audio connections between system trunk lines and remote site supervisory, ready, and conference circuits. The RTC circuit is common to the three remote tributary group (RTG) and the 24 remote tributary single (RTS) circuits located in units 5, 6, and 7. The RTC circuit processes digital status information from the tributary sites for transmission to the Console Local Equipment (CLE) sites. Levels A2 and A3 of unit 8 contain the TMC circuitry; levels A4, A5, and A7 are blank; and level A6 contains the RTC circuitry.

i. The select matrix control cabinet, unit 9, shown in figure 1-8, contains three identical select matrix control (SMC) circuits, one for each sector. The SMC circuits control the operation of the select matrix, which makes the audio connections between the CRE conference circuits and the tributary equipment. Levels A2 and A3 contain the group 1 (sector 1) SMC circuits, levels A4 and A5 contain the group 2 SMC circuits, and levels A6 and A7 house the group 3 SMC circuits. Levels A8, A10, and A12, for groups 1, 2, and 3, respectively, are located at the rear of the cabinet; these levels consist of terminal boards which permit tributaries to be connected on a part line or an individual basis. The terminal boards also permit the alarm circuits associated with unused groups of tributaries to be disabled. Levels A9 and A11 at the rear of unit 9 are not used.