TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL
VOICE COMMUNICATIONS EQUIPMENT MAINTENANCE

EXPANDED TROUBLESHOOTING
(LOGIC DIAGRAM THEORY)

GUIDED MISSILE AIR DEFENSE SYSTEM
AN/TSQ-73

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CHAPTER 6
VOICE COMMUNICATIONS EXPANDED TROUBLESHOOTING

Section I. INTRODUCTION

6-1. Scope. This manual is part three TM 9-1430-655-20-7 communications organizational maintenance for Guided Missile Air Defense System AN/TSQ-73 provides supplemental expanded troubleshooting information. This manual is published for the use and guidance of advanced personnel responsible for repair of voice communications beyond the scope of organizational maintenance covered in the basic TM 9-1430-655-20 series technical manuals.

6-2. Expanded Troubleshooting Concept. Expanded troubleshooting is required when existing fault isolation procedures in the basic manuals fail to isolate and correct a malfunction. The troubleshooting covered in this manual is based on use of existing on-site equipment (tapes, tools, test equipment, spare parts, and publications). Isolation of malfunctions is based on fault analysis of normal system operating conditions and using built-in M&D software programs.

6-3. Troubleshooting Aids. This manual contains functional logic diagrams to enhance troubleshooting and fault isolation capabilities. The functional logic diagrams and the associated circuit descriptions are intended to be self-contained and minimize requirements of additional troubleshooting aids. Also, power distribution diagrams, cabling diagrams, and front- panel schematic diagrams are supplied.

a. *Input/Output Tables*. Input and output tables are provided as applicable for each figure and sheet to enable easy access to signals referenced to other diagrams.

b. *Input and Output Symbology*. Symbols used on diagrams to indicate input and output signals include the following:

▲ Indicates input from another figure.
△ Indicates input from same figure.
■ Indicates output to another figure.
□ Indicates output to same figure.
◪ Indicates output to same and another figure.

c. Equipment Interface. The troubleshooting diagrams may reference inputs and outputs interfacing between other equipments. When a notation that an external equipment is involved, it is assumed that the user will refer to the applicable troubleshooting information provided for that equipment.

d. Logic Symbology. Logic symbology depends on card types. For discrete circuit cards containing conventional integrated circuits, conventional logic symbols are used. These symbols are used independently with card locations and card pin numbers notated with the symbol. For analog circuits, circuit card details are provided only to a functional level.

6-4. Physical Description (fig. 6-1). The voice communications equipment consists of a voice communications central (VCC) unit lA3A41, which includes a VCC control panel 1A3A41A1 and a VCC wired card cage 1A3A41A2, Voice communications also consists of two voice communications station (VCS) units 1A9 and lA10. Voice communications interface to external subscribers is accomplished through communications patching panel 1A3A40 and the communications demarkation panel which are also common to data communications. Table 6-1 provides a cross-reference list of part and drawing numbers for the AN/TSQ-73 system in reference designator order; this cross-reference is for identification of assembly and electrical drawings only. Refer to TM 9-1430-655-20-1 for a listing of wiring harnesses and cables and associated wire list or cable wiring diagrams.

a. Voice Communications Central. The VCC is located in the voice communications central cabinet assembly 1A3 on the left-hand side of the shelter above the power cabinet. The VCC is a solid state unit which occupies a five shelf card cage including three self contained power supplies. All controls and indicators on the VCC control panel assembly, with the exception of the power switches, are oriented toward fault isolation and maintenance.

b. Voice Communications Station. The total number of VCS's utilized in a shelter is four, with one VCS located in the right-hand assembly of each display console and two which are wall mounted on the left-hand side of the shelter above the maintenance bench and near the keyboard printer. The VCS consists of an electronic enclosure and a front panel assembly. The enclosure assembly houses four circuit cards and the front panel assembly houses the controls and indicators required to provide rapid access to the voice network.

(1) The primary communications end-instrument for the VCS in the wall mount configuration is a handset with a push-to-talk switch. A jack is also available for the option of using a headset in conjunction with, or instead of, a headset. In the headset configuration, a push-to-talk switch is not provided and requires a continuous hot microphone operation under control of a voice operated squelch. In the handset configuration,

the operator can select the option of continuous hot microphone operation or push-to-talk under switch control.

(2) The primary communication end-instrument for the console mounted configuration is a headset with a separate push-to-talk footswitch. A second headset jack provides the option of using two headsets per terminal. The operator can select the option of continuous hot microphone or push-to-talk under switch control.

c. Communications Patching Panel. The communications patching panel is located on the right side of the voice communications central unit and is hinged on the right for easy access. The panel provides for 4-wire data and voice duplex line connections through comm cables to remote stations. Operational control, command administration, and maintenance test voice nets are interfaced through address 01 thru 32. Local comm to remote stations (switchboards, etc.) are interfaced over 4-wire duplex lines through addresses 34 and 35. Intercom to site stations (guard posts and generators) are interfaced over 2 wire lines through address 36.

d. Communications Demarkation Panel. The communications demarkation panel is located at the back of the voice communications central unit and extends through the electrical equipment shelter wall. The panel contains 39 RFI filters to limit lighting induced transients up to 10 kv/microsecond.