TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL
DATA DISPLAY GROUP
EQUIPMENT MAINTENANCE

EXPANDED TROUBLESHOOTING
(LOGIC DIAGRAM THEORY)

GUIDED MISSILE AIR DEFENSE SYSTEM
AN/TSQ-73

DEPARTMENT OF THE ARMY

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Technical Manual

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HEADQUARTERS
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REPORTING OF ERRORS

You can help improve this publication. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, U.S. Army Missile Command, ATTN: DRSMI-SNPM, Redstone Arsenal, AL 35898. A reply will be furnished to you.

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CHAPTER 6

DATA DISPLAY GROUP EXPANDED TROUBLESHOOTING

Section I. INTRODUCTION

6-1. Scope. This manual is volume four of TM 9-1430-655-20-4 of the Display Equipment Maintenance for Guided Missile Air Defense System AN/TSQ-73 and provides supplemental expanded troubleshooting information. This manual is published for the use and guidance of advanced personnel responsible for repair of the display console beyond the scope of organizational maintenance covered in the basic TM 9-1430-655-20 series of technical manuals.

6-2. Expanded Troubleshooting Concept. Expanded troubleshooting is required when use of the existing fault isolation procedures in the basic manuals fail to isolate and correct a malfunction. It is assumed that expanded troubleshooting will be performed by personnel fully trained and experienced in the AN/TSQ-73 system and its mission. Expanded troubleshooting covered in this manual is based on the use of existing onsite equipment (tapes, tools, test equipment, spare parts, and publications). Isolation of malfunctions is based on the fault analysis of normal system operating conditions and the use of 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 the requirements for additional troubleshooting aids. Power distribution diagrams, cabling diagrams, and front-panel schematic diagrams are also 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/Output Symbols. Symbols used on diagrams to indicate input and output signals include the following: A Indicates input from another figure:

▲ 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 pieces of equipment. When a notation shows that external equipment is involved, it is assumed that the user will refer to the applicable troubleshooting information provided for that equipment.

d. Logic Symbols. Logic symbols depend 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 Data Display Group (DDG) is a freestanding assembly comprising a cabinet with two power supplies, and a front panel assembly, two card cage/array assemblies, a blower fan, miscellaneous minor components, and associated cabling and connectors. Two DDG's (units 1A7 and 1A17) are usually installed in the AN/TSQ-73 system shelter. In the Group configuration, both are used; in the Battalion configuration, only unit 1A7 is used. Provisions are made for installing either DDG, or both, in a remote position external to the system shelter. Refer to TM 9-1430655-20-1 for cabling diagrams depicting the various DDG installations.

a. Cabinet Assembly. The DDG cabinet assembly is an electromechanical enclosure that houses a control panel assembly, two power supplies, and two card cage/array assemblies. Mechanically, the cabinet contains a cooling system, two hinged doors, and mounting provisions for mechanical components.

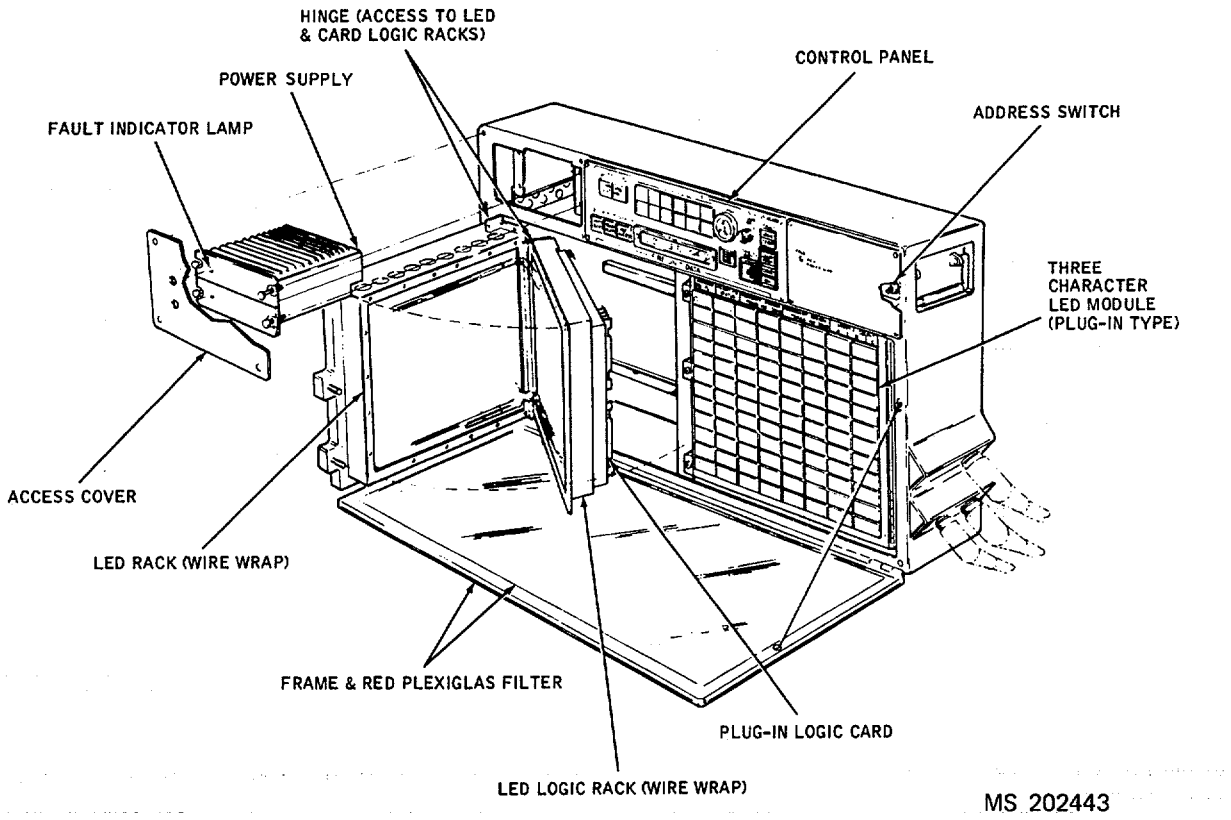


Figure 6-1. Data Display Group (DDG)

(1) *Front Panel Assembly (fig. 6-2).* The front panel assembly contains the control panel assembly and the status board section. The control panel assembly is mounted in the upper section of the cabinet. With the use of lamps and audible alarms, the panel provides fault indicators, operational status, and the state of alert information. The status board section houses the LED displays, which provide fire unit information and status.

(2) *Card Cage/Array Assembly (fig 6-3).* The card cage/array assemblies include the left-hand (A2) and right-hand (A3) assemblies. They are mounted in the lower front of the cabinet. Hinges on the outside permit easy access to the printed circuit cards and backplane wiring.

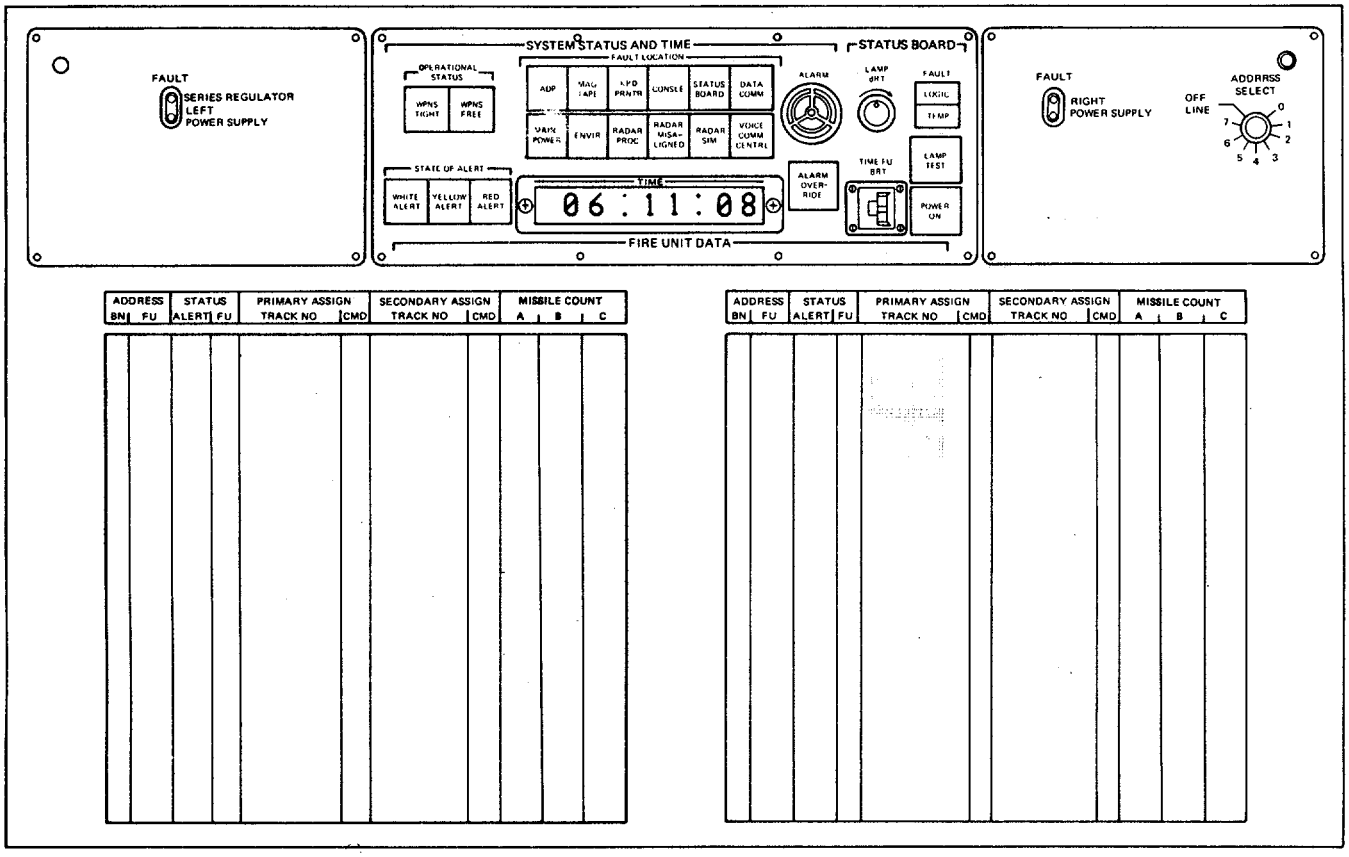
(3) *Cooling System.* Cooling within the cabinet is accomplished by air circulation from an internally mounted blower fan which draws in filtered air for distribution to the electronic components.

(4) *Cabinet Cable Set (fig. 6-4 and 6-5).* The cabinet cable set includes wiring harnesses, and cable assemblies W291 thru W294. The cable set provides electrical interconnections between internal electronic components, and external interface. The interface connectors are located on the right side of the cabinet.

(5) *Power Supplies.* The power supplies are mounted in the upper left (PSI) and upper right (PS2) sections of the data display cabinet. Each power supply is provided with a fault indicator.

(6) *Series Regulator.* The series regulator (A4), an electronic component assembly located in the center rear of the cabinet, provides voltage regulation for the output of PS1.

b. Circuit Card Location. The circuit cards in the data display group are mounted inside the card cage/array, right-hand and left-hand sides. Refer to figure 6-6 for individual circuit card locations.



LEFT HAND SIDE

RIGHT HAND SIDE

MS 202444

Figure 6-2. DDG Front Panel Assembly

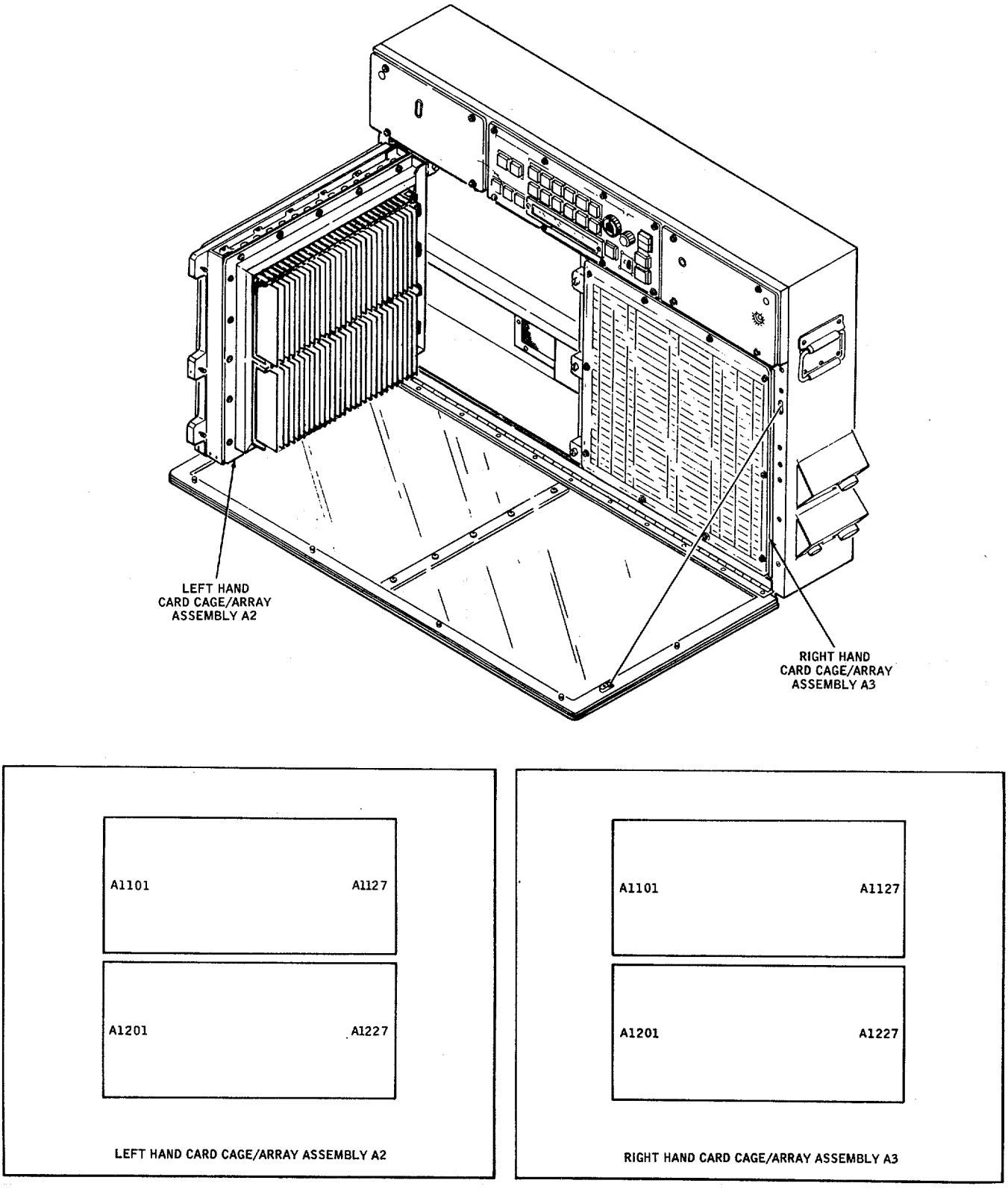


Figure 6-3. DDG Card Cage/Array Assembly