



Publication: 200738A

Release Date: March 1991

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Technical Manual

for

Monitor Loudspeaker Panel

LSP Series

[Models LSP-4, LSP-6, LSP-7 and LSP-8]

The Technical Materiel Corporation
700 Fenimore Road
Mamaroneck, New York 10543-0142 U.S.A.

What does TMC do?

The Company

The Technical Materiel Corporation (TMC) is engaged in the business of communications engineering. Simply stated, we make it possible for people and machines to communicate with one another by planning, creating and combining equipment to provide complete facilities for modern communications. We accomplish this with people, working at various TMC locations worldwide.

Our line of over 400 products range from the basic assemblies used in RF transmission to the complex systems used in computer command and control. Designed to carry data, facsimile, video and voice throughout the world, these products include -

Communication Systems
Transceivers
Transmitters
Receivers
RF Antenna Couplers
Security Equipment
Remote Control Systems
Computer Hardware/Software
RF/Digital Connectors
Patch Panels
Audio/FSK Products
Tools and Test Equipment

Since 1947, when TMC was first organized as a supplier of electronic equipment to the U.S. Armed Forces, the focus of the company has been on providing customers throughout the world with the type of equipment they need to communicate. Our customers include commercial users, both U.S. and foreign governments, and civil defense agencies. Today, TMC equipment is found in 140 countries on five continents. It is so reliable that we still support operating equipment built in TMC plants over 30 years ago.

Engineering

TMC invests in the future of its customers by constantly upgrading its product line with new materials and techniques. Our engineering staff has a dual purpose: support the customer in the field and develop new products to meet that customer's changing needs. This ongoing effort has created a loyal following among professionals worldwide as well as an extensive product line backed by broad technical expertise in modern communications.

The technical products engineered by TMC satisfy real customer needs. They are designed for use by practical engineers and technicians operating large communications installations. These products and services provide customers with the greatest possible value. As a result, TMC has gained a solid reputation as a supplier of practical communications products that operate reliably at low cost over long periods of time.

Quality

Only the finest workmanship goes into the design and manufacture of TMC products. There is no compromise here. Our equipment is designed to last for many years. We build in to the assembly process many tests that detect flaws in the product. Before any product leaves the factory, all flaws are corrected - otherwise, the product never gets into the field. Our success in achieving zero-defect quality is measured by the long list of customers who have repeatedly come back to TMC over the decades. It is this respect and loyalty that assures our customers are always offered the best in modern equipment designs for their communications needs.

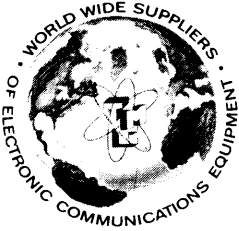
Customer Support

Our sale never ends with delivery of equipment to a customer. We maintain a staff of electronic and mechanical engineers, all with many years of experience, who travel to outlying sites to maintain and install our equipment. They also train technicians "on the job" in correct procedures so that equipment is assured a long, trouble-free life.

Closer to home, the **engineering services** TMC offers cover the full spectrum of support for the complex and varied products operating in the field. These services include -

System Engineering
Software Development
Service and Installation
Assembly and Test
Packaging
Program Management
Publications
Site Preparation and Design
Spare Parts Support
System Integration
Network Design
Training

Customer support, however, goes beyond these services. There are the people at TMC - a telephone call away from answering any question - technical or otherwise. There is the **TMCommunicator** newsletter which keeps users of TMC products advised of the latest developments in modern equipment design. There is the computer call-in service which allows users to enter inquiries directly into an on-line computer database for a 24-hour response. There are the product bulletins, the technical manuals, the application notes, the field service notes - all the support you need to do an effective job with TMC products.



PLEASE READ THIS FIRST

Dear **TMC** Product User:

Thank you for purchasing the **TMC Series LSP Monitor Loudspeaker Panel**. This series provide up to four channels of audio monitoring on a single panel. Each loudspeaker assembly can be equipped with its own volume control depending on the model selected.

The speaker panel is described in detail in the enclosed technical manual. This publication provides important information about using TMC equipment. Please read it.

If you need additional data or some specific technical information, please call our **Customer Service at (914) 698-4800** or return the business reply card located at the end of the manual. Our **tele-FAX (facsimile) number is 914-698-4805**. If you are missing any items, please contact TMC directly or through a local sales office.

Thank you for selecting the TMC Series LSP Monitor Loudspeaker Panel.

The Technical Materiel Corporation
Product Marketing

THE TECHNICAL MATERIEL CORPORATION

Section 1 - General Description

1.1 Functional Description

1.1.1 Overview

The LSP Series of Monitor Loudspeaker Panels provide high-quality monitoring of voice circuits. Up to four channels may be monitored on one panel, each channel with its own loudspeaker and optional volume control. This simple, but effective method of dynamically monitoring audio channels may be used with any device providing an audio input impedance up to 10,000 ohms unbalanced or 600 ohms balanced.

1.1.2 Controls and Indicators

All volume controls are located on the front panel with audio connections made conveniently to a terminal strip mounted to the reverse side of the panel. There are no indicators since the LSP is a passive device and requires no external power supply to operate properly.

1.1.3 Input/Output Characteristics

Since each loudspeaker assembly is inspected and tested at the TMC factory prior to shipment, the LSP unit can be installed immediately upon receipt at the site. No further adjustments are required.

1.2 Physical Description

Four modules can be configured for each 19-inch panel. This provides a compact, economical package suitable for both commercial and military service. Based on the number of channels monitored, the speakers are sized to the panel spacing. Available for "off-the-shelf" delivery, the LSP units have been assigned both US military nomenclature and Federal stock numbers.

1.3 Technical Specifications

Input Impedance Nominal 4 ohms unbalanced

Optional 600-ohms balanced or up to 10K-ohms unbalanced w/transformer

Speaker Impedance Nominal 4, 8, 16 or 45 ohms per loudspeaker

Power Capability Approximately 4 watts per speaker

Rear Panel Connection Standard terminal block

Input Power Not required

Speaker Size 4 inches (10.2cm)

Construction Aluminum alloy with external stainless-steel hardware

Dimensions (Overall) 5.25H x 19W x 2.5D inches

Weight Nominal 5 lbs (2.3Kg) for LSP-6 depending on option selected

Environmental Operating 0° to +50°C; 95% R.H.

US MIL Nomenclature

LSP-4 LS-452/U

LSP-6 LS-453/U

Warranty

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment - except electron tubes, semi-conductor devices, fuses, lamps, batteries, and articles made of glass or other fragile or expendable materials - purchased hereunder to be free from defect in workmanship and materials under normal use and service, when used for the purposes for which the same is designed, for a period of ONE YEAR from the date of delivery FOB factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, FOB factory, which may fail within the stated warranty period, provided:

- Any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction;
- The defect is not the result of damage incurred in shipment from or to the factory;
- The equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise; and
- Any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

At TMC's option, any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid and the TMC RETURN AUTHORIZATION number clearly marked on the package. Electron tube warranty claims should be made directly to the manufacturer of such tubes since tubes furnished by TMC bear only the manufacturer's warranty.

No warranties, expressed or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the purchaser's sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of such equipment, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

All inquiries should be directed to the following:

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<p>The designation "LSP" is used to refer interchangeably to the LSP-4, LSP-6, LSP-7 and LSP-8. Any variations to this convention are noted.</p>
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Section 1 - General Description

1.1 Functional Description

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All volume controls are located on the front panel with audio connections made conveniently to a terminal strip mounted to the reverse side of the panel. There are no indicators since the LSP is a passive device and requires no external power supply to operate properly.

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Four modules can be configured for each 19-inch panel. This provides a compact, economical package suitable for both commercial and military service. Based on the number of channels monitored, the speakers are sized to the panel spacing. Available for "off-the-shelf" delivery, the LSP units have been assigned both US military nomenclature and Federal stock numbers.

1.3 Technical Specifications

Input Impedance 10,000 ohms, ungrounded

Speaker Impedance 45 ohms per loudspeaker

Power Capability Approximately 4 watts per speaker

Rear Panel Connection Standard terminal block

Input Power Not required

Speaker Size 4 inches (10.2cm)

Construction Aluminum alloy with external stainless-steel hardware

Dimensions (Overall) 5.25H x 19W x 2D inches

Weight Nominal 5 lbs (2.3Kg) for LSP-6 depending on option selected

Environmental Operating 0° to +50°C; 95% R.H.

US MIL Nomenclature	LSP-4	LS-452/U
	LSP-6	LS-453/U

1.4 LSP Product Group

LSP-4	Monitor Loudspeaker Panel, One-channel
LSP-6	Monitor Loudspeaker Panel, Two-channel
LSP-7	Monitor Loudspeaker Panel, Three-channel
LSP-8	Monitor Loudspeaker Panel, Four-channel

Options:

/B	Balanced input, 600-ohm impedance
/V	Volume control for each channel

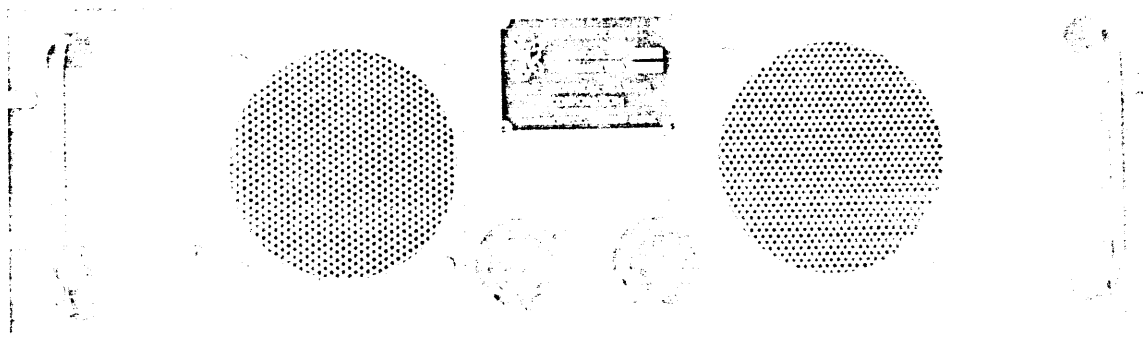


Figure 1.1 - Model LSP-6 Monitor Loudspeaker Panel

Section 2 - Installation

2.1 Initial Inspection

2.1.1 General

Every LSP undergoes a thorough testing prior to shipment. Upon receipt of the unit, check the packing case and its contents for obvious damage. Unpack the equipment carefully to reduce the risk of damage and to avoid misplacing any parts shipped as loose items. See Table 2.1 for a list of the loose items.

2.1.2 Damage By Carrier

With respect to equipment damage for which the carrier is liable, TMC will assist in describing methods of repair as well as furnishing replacement parts.

2.2 Electrical Installation

The LSP equipment should be located in such a way that sufficient clearance is obtained at the rear of the unit for making all audio connections. The front panel controls should also be within easy reach of an operator. The design of the LSP allows "stacking" of LSP units, one above the other, in the same rack.

The following external connection must be made to the LSP after it has been installed in an equipment rack:

Inputs - Connect the inputs to the LSP from the associated receivers or inter-com system via the terminal board TB1 on the rear panel.

2.3 Performance Check

When the appropriate audio connections have been made to the LSP, it is ready for immediate use. No further checks are required.

Table 2.1 - Loose Items Supplied

Technical Manual	1 each
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Section 3 - Operation

3.1 General

3.1.1 Controls

The only operating controls are the optional volume controls (marked INCR) on the front panel. With these controls, the individual audio levels can be adjusted to a comfortable level.

3.1.2 Procedures

After connecting the inputs and turning the optional INCR switch, no further operating procedures are required. The LSP is fully operational without further adjustment.

Section 4 - Maintenance

4.1 General

Each loudspeaker assembly is installed as a unit and should a malfunction occur, the entire assembly can be replaced. On the first indication of trouble, check the volume control and loudspeaker before replacing the loudspeaker assembly. First check the volume control for an open or short circuit. Examine the terminal strip for broken or loose connections. A continuity check of the voice coil will reveal whether the loudspeaker is open or short-circuited.

4.2 Preventive Maintenance

4.2.1 General Cleaning Methods

Preventive maintenance for the LSP consists of routine functions such as visual inspection and cleaning. Periodic cleaning is recommended as dust may build up on components, reducing the efficiency of the coupler unit and possibly causing circuit failure. To facilitate cleaning the unit, use a vacuum cleaner or a low-pressure filtered compressed-air supply.

4.2.2 Visual Check and Adjustment

A simple visual check of the unit when it is opened up for servicing or cleaning with often reveal potential trouble spots and thereby reduce downtime due to component failure. Signs of trouble may be found in discoloration, warped printed circuit boards and damaged wiring or cables. Any deteriorating component should be replaced immediately. All hardware should be checked for tightness during preventive maintenance inspections.

4.4 Repair

Repair work generally consists of replacing the defective component. The following cautions should be observed:

- Make sure the replacement component is an exact duplicate of the defective one. This is particularly important in the amplifier modules.
- Place any new component in the same location as the component it replaces. The dressing of any wire runs should not be altered.

Section 5 - Parts List and Schematic Diagram

IMPORTANT NOTE

Reference designations are assigned to identify all electrical parts of the equipment. These designations are used for marking the equipment (adjacent to the part they identify) and are included on drawings, diagrams and the parts list. The letters of a reference designation indicate the kind of part (generic group), such as resistor, capacitor, transistor, etc. The number differentiates between parts of the same generic group and are normally indexed sequentially; omitted numbers are noted on the diagrams. Sockets associated with a particular plug-in device - such as transistor, integrated circuit, fuse - are identified by a reference designation which includes the reference designation of the plug-in device. For example, the socket for fuse F101 is designated XF101. When ordering replacement parts, specify the TMC part number. The model number of the equipment is useful but not essential since TMC utilizes identical parts that are common to many different types of equipment.

SYMBOL	DESCRIPTION	TMC Part#
LS[101][102][103][104]	Loudspeaker	LS101
TB101	Terminal Strip, Barrier	TM102-[4][6][8]
R[101][102][103][104]*	Volume Control	RV122T4-14
T[101][102][103][104]*	Transformer, Audio	TF261

* Option

