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Technical Manual

for

LF/MF Receiving Antenna Multicoupler

Model LMC-8

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



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THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS

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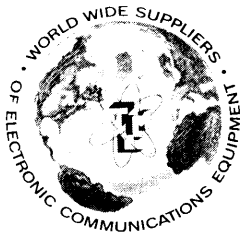
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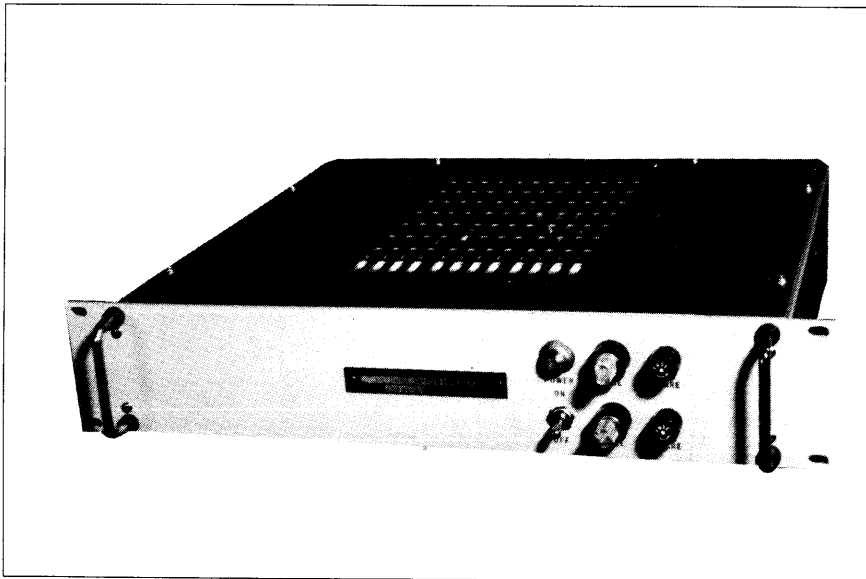
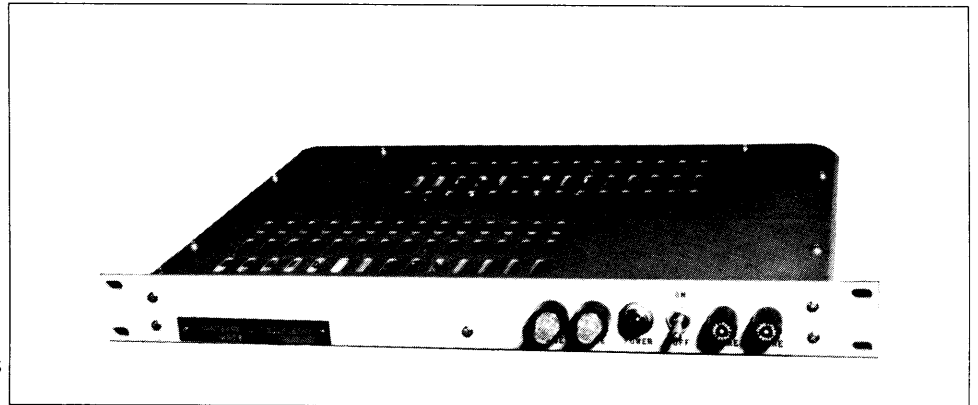
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Model LMC-8

**One RF Antenna Input
Eight LF/MF RF Outputs**



Model LMC-16

**One RF Antenna Input
Sixteen LF/MF RF Outputs**

Model LMC-32

**One RF Antenna Input
Thirty-two LF/MF RF Outputs**

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Section 1 - General Description

1.1 Functional Description

1.1.1 Overview

The LMC-8 MF/HF Antenna Multicoupler is a broadband coupling unit, used for coupling up to eight low/medium frequency communication receivers to one common antenna, simultaneously. In addition, the multicoupler may be used as an RF distribution unit when multiple signals from one source are required for test or analysis. The multicoupler provides a nominal 2dB gain from the antenna to any receiver, with a wide dynamic range and low noise characteristic over the frequency range of 10KHz to 5MHz. The equipment is designed to provide excellent isolation from receiver to receiver and from each receiver to the antenna. The multicoupler is fully solid state, including power supply components.

1.1.2 Major Assemblies

The multicoupler consists of one input preamplifier, one output buffer amplifier for each RF output port provided, and a regulated power supply. The input preamplifier is connected to the output amplifiers through an RF distribution line.

1.1.3 Input/Output Characteristics

The input and output characteristic impedance is 50 ohms, with a VSWR better than 1.5-to-1. Optionally, 70 ohms impedance can be provided. Isolation is maintained to a minimum of -40dB between each receiver terminal and -55dB from each receiver terminal to the antenna input.

1.1.4 RF Outputs

The number of output ports available with the LMC-8 is fixed. Eight LF/MF outputs are provided from a common antenna. Input/output connectors, other than the BNC-type normally installed, may be substituted depending on the interconnect required at the receiving site.

1.2 Physical Description

1.2.1 Equipment Mounting

The LMC-8 is designed for mounting in a standard 19-inch rack. The operating controls are located on the front panel. The input connector, output connectors and primary power socket are mounted on the rear panel. The amplifiers and power supply regulator are mounted on printed circuit boards which are in turn bolted to the coupler chassis.

1.2.2 Semiconductor Complement

A list of a semiconductors used in the LMC-8 are listed in Table 1.1.

Table 1.1 - Semiconductor and Integrated Circuit Complement

Power Supply and Regulator	
Rectifier Bridge	NW10005
Bias Regulator	1N758A
Bias Regulator	1N914B
Current Regulator	TX10001
Voltage Regulator	2N5086
Voltage Regulator	2N3055
Preamplifier and Output Circuits	
Bias Regulator	1N914B
Buffer	2N3866
Current Amplifier	2N5160

1.3 Technical Specifications

Frequency Range 10KHz - 5MHz no filter; 10KHz - 2MHz with lowpass filter; other filters including broadcast stopband filter are available which allow operation to 40MHz.

Number of Outputs Eight LF/MF output ports with frequency range determined by input filters installed.

Input/Output Impedance Nominal 50 ohms, unbalanced. 70 ohms is available. BNC-type connectors. N-type and others are available.

Insertion Gain Nominal +2dB over operating range.

Frequency Response +/-1.0dB, 10KHz-2MHz

Offband Rejection Greater than -30dB, 6-100MHz.

Noise Figure Less than +7dB, nominally +5dB.

Output/Output Isolation Greater than -40dB

Output/Input Isolation Greater than -55dB

Phase Differential +/-1 degree maximum, output-output

Desensitization For a 4-volt peak input, 10% removed from the operating frequency, a 100 microvolt received signal drops less than 3dB.

1.3 Technical Specifications (Continued)

Intermodulation Distortion For 50-ohm units: Second order is greater than -60dB for a 0.4-volt input; Third order is greater than -65dB.

VSWR Output is better than 1.2-to-1; Input is better than 1.5-to-1.

Mean-Time-Between-Failure Nominally 20,000 hours

Operating Features

Cooling Convection, no fans or moving parts

Ambient Conditions 0oC to +50oC; Up to 95% R.H. Storage -30°C to +80°C

Primary Power 115VAC standard/230VAC optional, 48-400Hz, single phase.

Power Consumption 25 watts maximum.

Size and Weight 1.75H x 19W x 14D inches, 8lbs (3.6Kg)

Line Filters Greater than 40dB attenuation, 14KHz-150MHz.

Special Features

Monitoring Indicating fuseholders display status of primary power circuits

Safety Fuse and front-end overload protection, preventing circuit failure from high RF voltages at the input. High voltage points are covered and labelled.

Components and Construction Totally solid state circuits mounted to an aluminum alloy chassis. External hardware is stainless steel. Track slides are optional and due to weight distribution, are usually not required.

1.4 LMC Product Group

LMC-2X4 **Dual LF Receiving Antenna Multicoupler, 2X4 Outputs**
LMC-2X8 **Dual LF Receiving Antenna Multicoupler, 2X8 Outputs**
LMC-2X16 **Dual LF Receiving Antenna Multicoupler, 2X16 Outputs**

LMC-8 **LF Receiving Antenna Multicoupler, Eight Outputs**
LMC-16 **LF Receiving Antenna Multicoupler, 16 Outputs**
LMC-32 **LF Receiving Antenna Multicoupler, 32 Outputs**

50-ohm Series Options:

- 5F0 50-ohm operation, no input filter
- 5F2 50-ohm operation, broadcast stopband filter (0.6-1.9MHz)
- 5F4 50-ohm operation, low-pass input filter ($f_c = 2.0\text{MHz}$)

70-ohm Series Options:

- 7F0 70-ohm operation, no input filter
- 7F2 70-ohm operation, broadcast stopband filter (0.6-1.9MHz)
- 7F4 70-ohm operation, low-pass input filter ($f_c = 2.0\text{MHz}$)

Note: Input filters may be combined in LMC-2Xn series only.
Other filters to suit specific applications are available on request.

When ordering, specify both model and option. Example: LMC-8/5F4

Section 2 - Installation

2.1 Initial Inspection

2.1.1 General

Every LMC-8 undergoes a thorough testing and calibration 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

2.2.1 Primary Power

The LMC-8 operates from a 115VAC, 48 to 400Hz power source. Optionally, the LMC-8 may be wired for 230VAC, which will be noted by a decal on the rear panel adjacent to the input power connector.

2.2.2 External Connections

The following external connections must be made to the LMC-8 after it has been installed in an equipment rack:

Antenna The antenna cable must be fitted with a connector that mates with the LMC-8 connectors provided. Normally, this is a BNC-type connector, although such connectors as type N are also available. This antenna cable is then connected to ANTENNA INPUT jack 1J1 on the rear panel of the LMC-8.

Power Connect primary power to the unit by plugging the supplied power cable assembly into POWER INPUT connector 1J34 on the rear panel. Ensure that the plug lines up properly with the socket using the keyway as a guide.

Outputs Connect the outputs of the LMC-8 to the associated receivers via the RF connectors mounted to the rear panel. RF coaxial cables, terminated with the proper mating connectors, are required for this connection.

2.2.3 Clearance Requirements

The LMC-8 equipment should be located in such a way that sufficient clearance is obtained at the rear of the unit for making all RF connections. The front panel controls should also be within easy reach of an operator. The solid state design of the LMC-8 reduces heat problems, allowing "stacking" of up to five LMC-8 units, one above the other, in the same rack. If more than five units are stacked, heat-related problems may occur after prolonged use of the multicouplers. To reduce the possibility of this happening, the equipment cabinet should be fitted for forced air cooling or the couplers should be separated vertically by sufficient space to allow dissipation of the heat into the operating area.

2.3 Performance Check

2.3.1 General

When the appropriate power connections have been made to the LMC-8, turn the POWER switch 1S1 to the ON position. The POWER lamp 1DS1 will light, indicating that the LMC-8 is ready for use. No further checks are required.

Table 2.1 - Loose Items Supplied

CA10505	Power Cable Assembly	1 each
203036	Technical Manual	1 each
UGxx	Mating Connectors	Optional extra

Section 3 - Operation

3.1 General

3.1.1 Controls

Table 3.1 contains a list of the operating controls and indicators that are located on the front panel of the LMC-8.

3.1.2 Procedures

After connecting the antenna, communication receivers and power supply, and turning on the POWER switch, no further operating procedures are required. The LMC-8 is now fully operational without further adjustment.

Table 3.1 Controls and Indicators

Power ON/OFF switch 1S1	Controls primary power application
POWER lamps 1DS1	Lights when primary power is applied and switch 1S1 is turned ON.
FUSE holder/indicator 1F1,1F2	Indicates failure of fuse by illumination of the fuseholder.
SPARE fuse	Two spare fuses are contained in spare fuseholders located on the front panel.

Section 4 - Principles of Operation

4.1 General

4.1.1 Capabilities

The Model LMC-8 Low/Medium Frequency Antenna Multicoupler is a broadband antenna distribution system, designed to couple one LF/MF antenna to the antenna inputs of up to eight communication receivers.

4.1.2 Input/Output

Both the input and output impedance of the LMC-8 multicoupler is nominally 50 ohms, and optionally 70 ohms. The standing wave ratio characteristic is better than 1.5-to-1 over the frequency range of 10KHz to 5MHz.

4.1.3 Salient Performance Features

The LMC-8 multicoupler provides a nominal insertion gain of 2dB from the antenna input to each connected receiver. The coupler is designed to ensure minimum noise generation, and to provide a high degree of intermodulation rejection and isolation between the connected receivers. The rejection and isolation figures for this equipment are stated in the Technical Specifications section of this manual (See Section 1.3).

4.1.4 Equipment Structure

The LMC-8 multicoupler consists of three major sections as shown in System Block Diagram (Figure 4.1) and as is described in the following paragraphs. These sections consist of the preamplifier assembly (1A2/1A3); the output buffer assemblies (1A4/1A5); and the regulated power supply (1A1).

4.2 Preamplifier (1A2 is referred to in text)

4.2.1 Location and Features

The preamplifier is mounted on a printed circuit board designated 1A2. It is a low-noise, wide-band amplifier having a 50-ohm impedance and a nominal voltage gain of 8.5dB. Figure 4.2 depicts its location in the chassis, while Figure 7.2 can be used to locate components and Figure 7.3 is the schematic diagram.

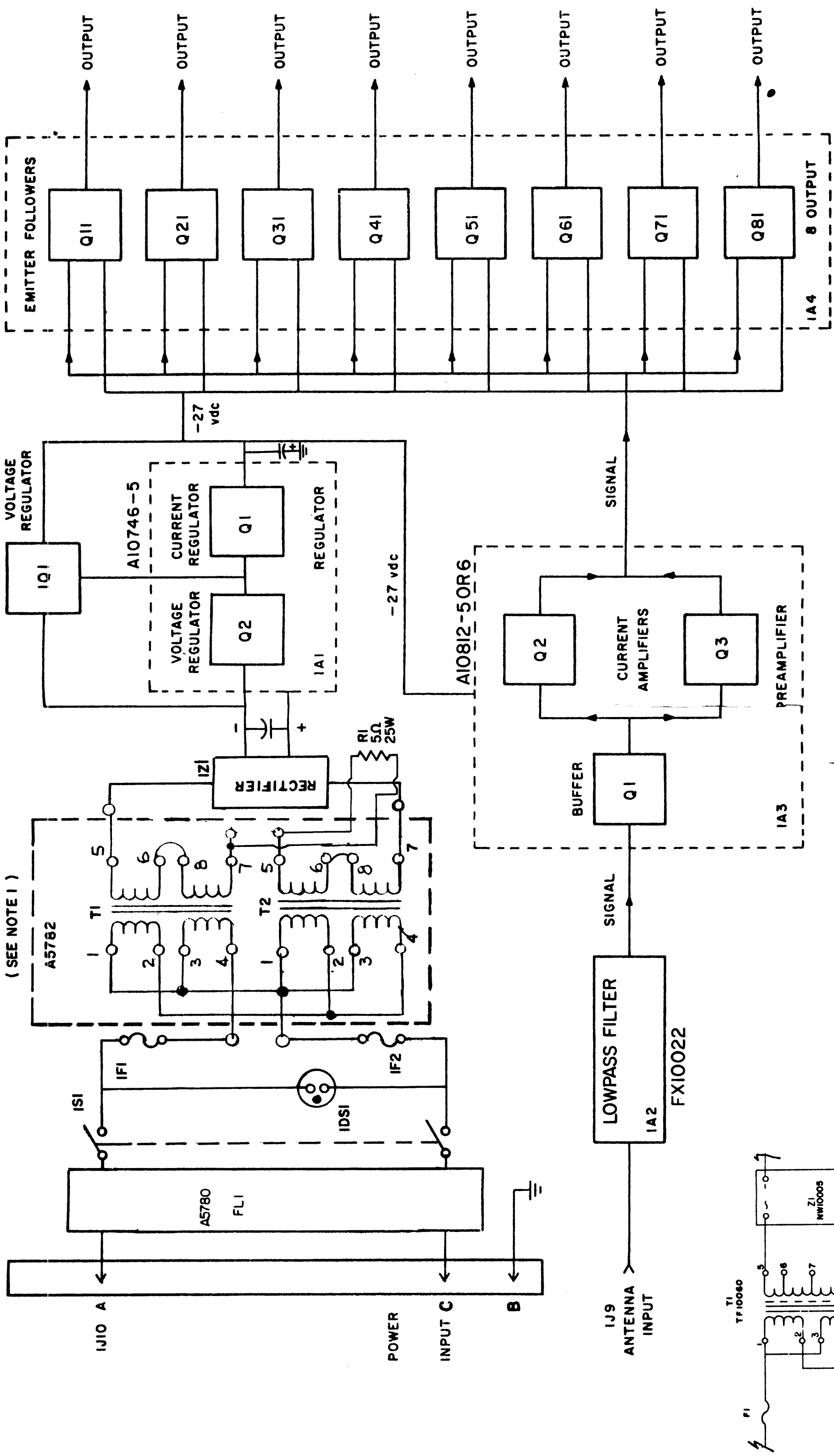
4.2.2 Circuit Analysis

The input to the amplifier is RC-coupled through 1A2R1/1A2C1. This input drives a grounded emitter-buffer amplifier 1A2Q1. The buffer amplifier is followed by a parallel amplifier 1A2Q2/1A2Q3, which provides minimum intermodulation of higher order products. Negative feedback is accomplished through 1A2R8/1A2C11 with a bootstrap connection through 1A2C10. Temperature compensation is obtained with diodes 1A2CR1/1A2CR2 in the bias circuit consisting of 1A2R4, 1A2R5 and 1A2R6. 1A2R7/1A2C12 provide bias for the buffer amplifier 1A2Q1.

4.2.3 Power Distribution

Power for the preamplifier is obtained from the -28VDC regulated supply 1A1. This DC voltage is heavily decoupled through 1A2C62, 1A2C3, 1A2C5, 1A2C6, 1A2C7, 1A2C13, 1A2C14 and 1A2L1 to prevent distortion from the rectified power supply.

A10791-5 OR 6



(SEE NOTE 1)

NOTE 1,
SOME UNITS MAY USE TF10060 IN PLACE
OF ASSEMBLY A5782 (T1, T2)

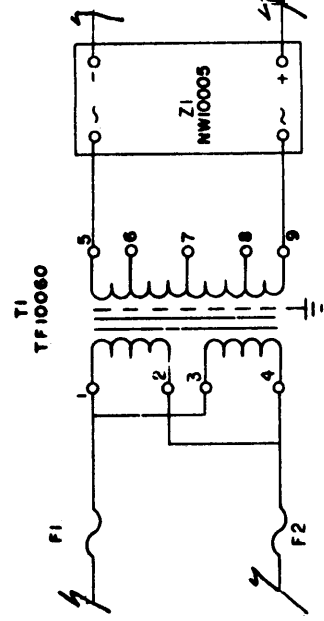


Figure 4.1 System Block Diagram

4.3 Output Buffer Amplifier

4.3.1 Location and Features

The RF distribution line parallel-feeds identical buffer amplifier assemblies, as shown in Figures 4.2 (assembly), 7.4 (components) and 7.5 (schematic). Each amplifier assembly consists of emitter-follower amplifiers, with an output impedance of 50 ohms and an attenuation of 6.5dB. Therefore, the overall nominal multicoupler insertion gain from the antenna to each output is +2dB.

4.3.2 Circuit Analysis

The input from the RF distribution line is RC-coupled through 1A3R11/1A3C11 to the base of emitter-follower 1A3Q11. Bias is obtained with 1A3R12/1A3R13. The output from the emitter-follower is applied to the output terminal through a matched 50-ohm load circuit consisting of 1A3R15/1A3C13.

4.3.3 Power Distribution

The -28VDC power is obtained from the regulated power supply 1A1 and is filtered through 1A3C1, 1A3C2 and 1A3L11 to the decoupling capacitor 1A3C12 and load compensator 1A3L12 to the 2N3866 transistor via 1A3R14.

4.4 Power Supply and Regulator

4.4.1 Location and Features

The components comprising the power supply are all chassis mounted except for the regulator circuit which is mounted on circuit assembly 1A1. The latter is described in the following paragraphs (See Figures 4.2, 7.6 and 7.7).

4.4.2 Circuit Analysis

Primary power is supplied through two AC line RF filters (1FL1/1FL2) to the ON/OFF switch 1S1. When 1S1 is in the ON position, power is supplied through the two fuses 1F1/1F2 to the power transformer 1T1 and the front panel indicator lamp 1DS1. The secondary of transformer 1T1 produces 29VAC, which is rectified by bridge rectifier 1Z1, and filtered by capacitor 1C1.

4.4.3 Current and Voltage Regulation

The regulator board and transistor 1Q1 provide the voltage and current regulation required for the -29V supply. All components in this section, with the exception of transistor 1Q1, are mounted on printed circuit assembly 1A1. Potentiometer 1A1R7 is used to set up the initial -28V required by the LMC. Transistor 1A1Q1 and diodes 1A1CR1, 1A1CR2 and 1A1CR3 form a voltage reference circuit (sensitive to temperature and load changes) which in turn control Darlington-connected transistors 1A1Q2/1Q1. In addition to providing short-circuit protection, this also provides the necessary voltage and current regulation for the power supply. The -29VAC output from Pin 6 of the regulator board is filtered through 1L1 and 1C1, which are chassis mounted, and then fed to the circuit boards.

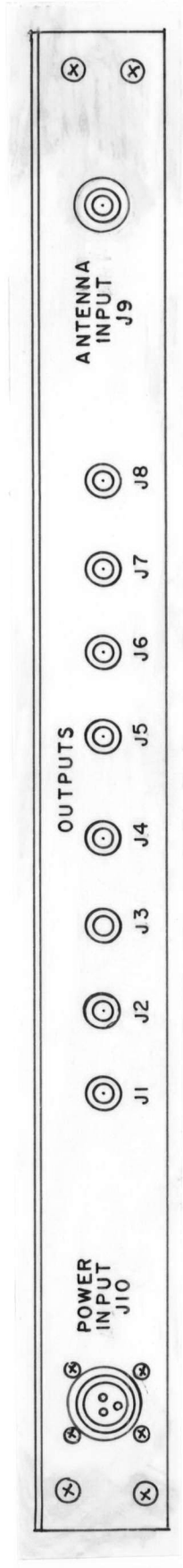


Figure 4.3 Assembly Line Drawing (Rear View)

Section 5 - Maintenance

5.1 General

5.1.1 Test Equipment Requirements

This section describes preventive maintenance, trouble-shooting and repair procedures for the LMC-8. The following equipment is suggested in order to perform these procedures properly:

- RF Signal Generator, H/P Model 651B or equivalent
- Oscilloscope, Tektronix Model 545 or equivalent
- Standard Volt-Ohmmeter

5.1.2 Component Location

For aid in the location of components, refer to Figures 4.2, 7.2, 7.4 and 7.6.

5.2 Preventive Maintenance

5.2.1 General Cleaning Methods

Preventive maintenance for the LMC-8 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.

5.2.2 Visual Check and Adjustment

A simple visual check of the unit when it is opened up for servicing or cleaning will 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.

5.3 Troubleshooting

5.3.1 General Failure Symptoms

During operation of the LMC-8, the following failure symptoms may be observed:

- No signal output from one or all receivers.
- Weak or noisy signals in one or all receivers.

5.3.2 Fault Localization

The primary objective of the troubleshooting procedure is to localize the fault to a particular section of the coupler unit. Table 5.1 provides a guide to locating and correcting the possible failures.

Tabl 5.1 - Troubleshooting Proc dures

Symptom:	No signal output at one or more receivers
Possible Cause:	Receiver failure (One output affected)
Remedial Action:	Refer to receiver manual
Possible Cause:	Interconnection, coupler to receiver (One output affected)
Remedial Action:	Check the RF cable between the receiver and coupler
Possible Cause:	Power supply failure in the coupler (All outputs affected)
Remedial Action:	If POWER ON lamp 1DS1 is not illuminated, check for power input failure or defective input filters 1FL1/1FL2. If POWER ON lamp is on, check indicating type fuses 1F1/1F2 and replace with spare if necessary. If both fuses are intact, proceed to check the transformer 1T1, bridge rectifier 1Z1 and voltage regulator 1A1. -28VDC should be available at terminal 6 of the regulator board.
Possible Cause:	Output buffer amplifier failure (One output affected)
Remedial Action:	If DC voltage is present at the output of the regulator and at the output buffer amplifier, possible failure of a component in the output amplifier is indicated. Removal, testing and repair of the module 1A4 or 1A5 will be necessary.
Possible Cause:	Failure of input preamplifier (All outputs affected)
Remedial Action:	If DC voltage is present at the output of the regulator and at the preamplifier, possible failure of a component in the preamplifier or failure in the input antenna circuit is indicated. For repair of the preamplifier, removal and testing of the module 1A2 or 1A3 will be necessary.
Symptom:	Weak or noisy signals to ALL receivers
Possible Cause:	Antenna fault
Remedial Action:	Connect the antenna lead-in directly to the antenna input of the receiver. If the symptom persists, check for a fault in the antenna system.
Possible Cause:	Faulty preamplifier
Remedial Action:	If the cause is not attributable to the antenna, possible failure of a component in the preamplifier is indicated. Removal, testing and repair of module 1A2 or 1A3 will be necessary.

Table 5 - Troubleshooting (Continued)

Symptom:	Weak or noisy signals in ONE receiver
Possible Cause:	Receiver noise
Remedial Action:	Refer to receiver manual
Possible Cause:	Interconnection, coupler to receiver
Remedial Action:	Check the RF cable between the coupler and receiver.
Possible Cause:	Faulty output buffer amplifier
Remedial Action:	Connect the receiver to another output terminal of the same module (1A4/1A5). If the symptom persists, the probable cause will be found in the power supply circuit of the module. If the symptom is no longer present, the fault will be found in the directly-associated buffer amplifier circuit or output connection. Removal, testing and repair of the module will be necessary if the fault is not located in the output connection.

5.4 Repair

5.4.1 General Method

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.
- Observe standard practice when replacing semiconductor components by using a low-wattage soldering iron and appropriate heat-sink tools.
- Avoid damage to the printed circuit wiring when handling or repairing amplifier and regulator modules.

5.5 Adjustments

5.5.1 Output Voltage Trim

Only one adjustment may be required in the LMC-8 multicoupler. Power supply regulator 1A1 contains a screwdriver-adjustable potentiometer (R7) that was pre-set, prior to shipment, to provide a -28VDC. If the output voltage is found to require adjustment, use an accurate voltmeter and re-set the voltage to -28VDC by rotating the potentiometer control clockwise to reduce voltage or counter-clockwise to raise voltage.

5.5.2 Amplifier Trim

The amplifiers do not require any adjustment since all components are of fixed values.

Section 6 - Parts Lists

A10739	Front Panel, Rear Panel and Main Chassis Assembly
A10746-5	Regulator Assembly (1A1)
A10791-6	Output Amplifier Assembly (1A4)
A10812-6	Preamplifier Assembly (1A3)

MAIN CHASSIS, FRONT & REAR PANELS

REF DESIGNATION	DESCRIPTION	TMC PART NUMBER
A1	VOLTAGE REGULATOR	A10746-5
A3	PREAMPLIFIER, 75 ohms	A10812-5
A3	PREAMPLIFIER, 50 ohms	A10812-6
A4	OUTPUT MODULE: 8 outputs, 75 ohms	A10791-5
A4	OUTPUT MODULE: 8 outputs, 50 ohms	A10791-6
A2	FILTER: Lowpass	FX10022
W1	CABLE: RF, coaxial with connectors	CA10530 or CA10662
* C1	CAPACITOR: Electrolytic, 2800 uF	CE112-15
DS1	LAMP: Neon	B1100-51
F1, F2	FUSE: slo-blo, 0.5 amp (115 Vac operation only)	FU102-.5
F1, F2	FUSE: slo-blo, 0.25 amp (230 Vac operation only)	FU102-25
FL1	FILTER: RF, line	A5780
J1 to J9	CONNECTOR: BNC, receptable	UG625B/U
J10	CONNECTOR: Receptable, male	MS3102A-14S-7P
S1	SWITCH: Toggle	ST22K
* T1, T2	TRANSFORMER: Power	A5782
Q1	TRANSISTOR	2N3055
Z1	DIODE BRIDGE NETWORK	NW10005

* Some units may use TF10060 (T1) in place of Assembly A5782 (T1,T2) some units may use CE44C222G in place of CE112-5.

A1, REGULATOR ASSEMBLY
A10746-5

REF. DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1, C6	CAPACITOR: Fixed, ceramic, 0.1 uF	CC10015-X5V104M
C2	CAPACITOR: Fixed, tantalum, 6.8 uF	CSR13G685ML
C3, C5	CAPACITOR: Fixed, tantalum, 0.47 uF	CSR13G474ML
C4	CAPACITOR: Fixed, ceramic, 0.01 uF	CC10017-X5V103M
CR1	DIODE: Zener	IN758
CR2,	DIODE	IN914B
R1	RESISTOR: Fixed, composition, 47K, $\frac{1}{2}$ W, 5%	RC20GF473J
R2	RESISTOR: Fixed, composition, 68K, $\frac{1}{2}$ W, 5%	RC20GF683J
R3	RESISTOR: Fixed, composition, 15 ohms, $\frac{1}{2}$ W, 5%	RC20GF150J
R4	RESISTOR: Fixed, composition, 560 ohms, $\frac{1}{2}$ W, 5%	RC20GF561J
R5	RESISTOR: Fixed, composition, 1.2K, $\frac{1}{2}$ W, 5%	RC20GF122J
R6	RESISTOR: Fixed, composition, 0.9K, $\frac{1}{2}$ W, 5%	RC20GF392J
R7	RESISTOR: Variable, composition, 1K, linear curve, $\frac{1}{2}$ W	RV111U102A
R8	RESISTOR: Fixed, composition, $\frac{1}{2}$ W, 6.8K, 5%	RC20GF682J
Q1	TRANSISTOR: NPN, silicon	TX10001
Q2	TRANSISTOR: PNP, silicon	2N5086

8 OUTPUT ASSEMBLY
A10791-5 and -6

REF. DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1, C2, C12, C13, C22, C23, C32, C33, C42, C43, C52, C53, C62, C63, C72, C73, C82, C83	CAPACITOR: Fixed, mica 2.2 uF	CC10018
C11, C21, 31, C41, C51, C61, C71, C81	CAPACITOR: Fixed, mica 0.22 uF	CC10019
L11, L21, L31, L41, L51, L61, L71, L81	INDUCTOR: RF coil, 220 uH	CL275-221
L12, L22, L32, L42, L52, L62, L72, L82	INDUCTOR: RF coil, 2200 uH	CL275-222
R11, R21, R31, R41, R51, R61, R71, R81	RESISTOR: Fixed, composition, 100 ohms, $\frac{1}{2}$ W, 5%	RC07GF101J
R12, R22, R32, R42, R52, R62, R72, R82	RESISTOR: Fixed, composition, 4.3 K, $\frac{1}{2}$ W, 5%	RC07GF432J
R13, R23, R33, R43, R53, R63, R73, R83	RESISTOR: Fixed, composition, 3.3 K, $\frac{1}{2}$ W, 5%	RC07GF332J
R14, R24, R34, R44, R54, R64, R74, R84	RESISTOR: Fixed, composition, 180 ohms, 1W, 5%	RC32GF181J
* R15, R25, R35, R45, R55, R65, R75, R85	RESISTOR: Fixed, film, 71.5 ohms, $\frac{1}{2}$ W, 1%	RN6D71R5F
Q11, Q21, Q31, Q41, Q51, Q61, Q71, Q81	TRANSISTOR	2N3866

*The value of R15 and R85 for -6 is 52.3 ohms

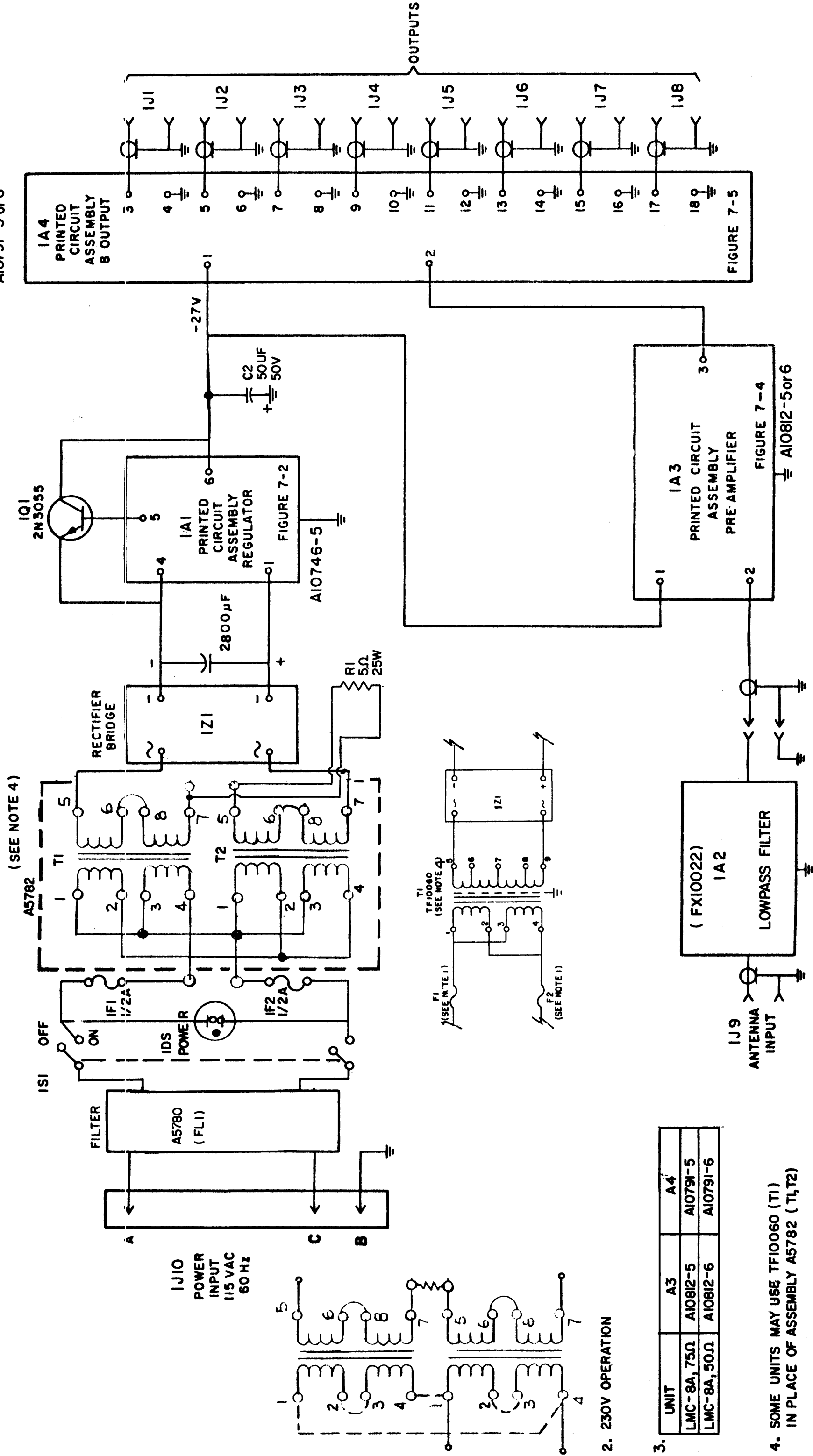
PREAMPLIFIER ASSEMBLY
A10812-5 and -6

REF. DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1, C2, C4, C6, C10, C12, C13	CAPACITOR: Fixed, ceramic, 2.2 uF	CC10018
C3, C7, C8	CAPACITOR: Fixed, ceramic, 0.1 uF	CC10020
C5, C14	CAPACITOR: Fixed, tantalum, 68 uF	CE10009
C9	CAPACITOR: Fixed, ceramic, 0.47 uF	CC10021
C11	CAPACITOR: Fixed, mica, 5pF	CM04ED050J03
CR1, CR2	DIODE	1N914B
R1*	RESISTOR: Fixed, deposited film high stability, 61.9 ohms, $\frac{1}{2}$ W, 1%	RN65D61R9F
R2	RESISTOR: Fixed, film, 1K, $\frac{1}{2}$ W, 2%	RL07S102G
R3	RESISTOR: Fixed, film, 51 ohms, $\frac{1}{2}$ W, 2%	RL07S510G
R4	RESISTOR: Fixed, film, 68 ohms, $\frac{1}{2}$ W, 2%	RL07S680G
R5	RESISTOR: Fixed, film, 560 ohms, $\frac{1}{2}$ W, 2%	RL07S561G
R6	RESISTOR: Fixed, film, 270 ohms, $\frac{1}{2}$ W, 2%	RL07S271G
R7	RESISTOR: Fixed, film 7.5 K, $\frac{1}{2}$ W, 2%	RL07S752G
R8	RESISTOR: Fixed, film, 180 ohms, $\frac{1}{2}$ W, 2%	RL07S181G
R9, R10	RESISTOR: Fixed, film, 10 ohms, $\frac{1}{2}$ W, 2%	RL07S100G
L1	INDUCTOR: RF, coil, 220 uH	CL275-221
Q1, Q3	TRANSISTOR	2N3866
Q2	TRANSISTOR	2N5160

* For -6 the value of R1 selected on test

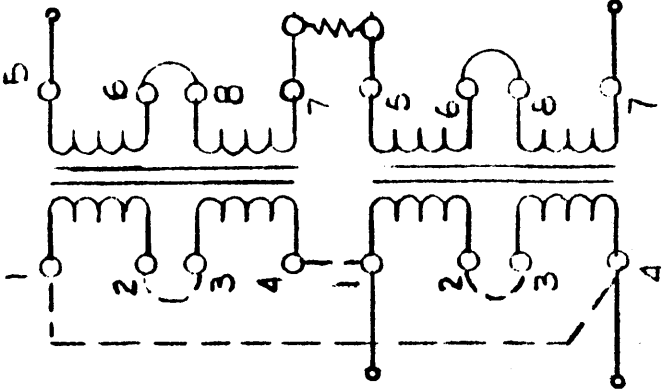
Section 7 - Schematic Diagrams

- Figure 7.1 Overall Schematic Diagram**
- Figure 7.2 Schematic Diagram, Preamplifier Assembly (1A3)**
- Figure 7.3 Component Location, Preamplifier Assembly**
- Figure 7.4 Schematic Diagram, Output Amplifier Assembly (1A4)**
- Figure 7.5 Component Location, Output Amplifier Assembly**
- Figure 7.6 Schematic Diagram, Regulator Assembly (1A1)**
- Figure 7.7 Component Location, Regulator Assembly**
- Figure 7.8 Schematic Diagram, Line Filter Assembly**
- Figure 7.9 Schematic Assembly, Low pass Filter Assembly (FX10022)**



(SEE NOTE 4)

I J10
POWER
INPUT
115 VAC
60 Hz



2. 230V OPERATION

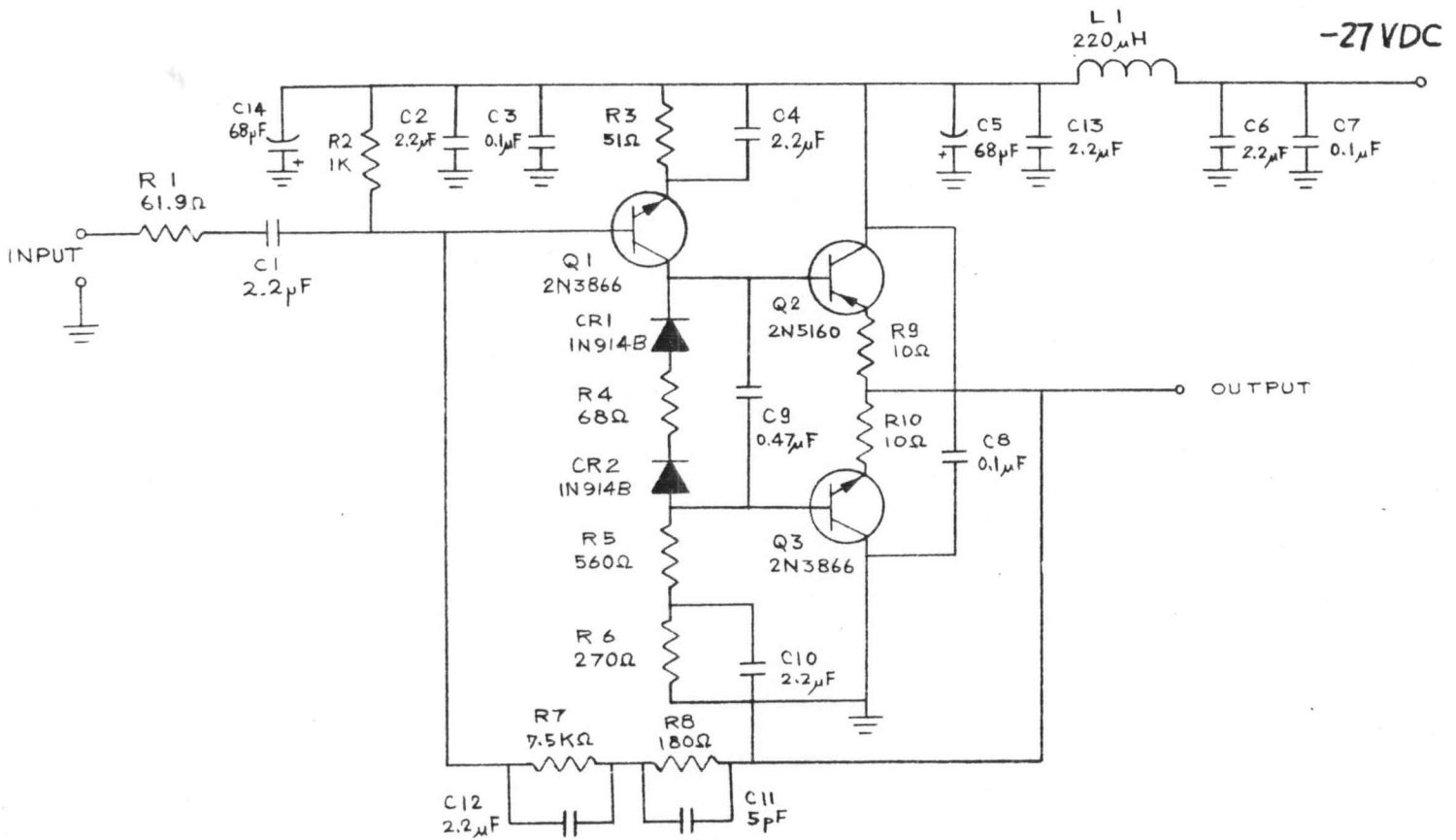
3.

UNIT	A3	A4
LMC-8A, 75Ω	AI0812-5	AI0791-5
LMC-8A, 50Ω	AI0812-6	AI0791-6

4. SOME UNITS MAY USE TF10060 (T1)
IN PLACE OF ASSEMBLY A5782 (T1, T2)

5. 230V OPERATION FOR TF10060
FOR 230 V OPERATION, T1 PRIMARY MUST
BE CONNECTED IN SERIES (ONLY TERMINALS 2 &
3 CONNECTED TOGETHER) 230 VAC APPLIED
TO TERMINALS 1 & 4

Figure 7.1 Overall Schematic



2. A10812-6

R1 VALUE SELECTED ON TEST
FOR 50Ω INPUT IMPEDANCE

1. UNLESS OTHERWISE STATED
INDUCTANCE IN MICROHENRIES
CAPACITANCE IN MICROFARADS
RESISTANCE IN OHMS

NOTES

Figure 7.2 Preamplifier Assembly

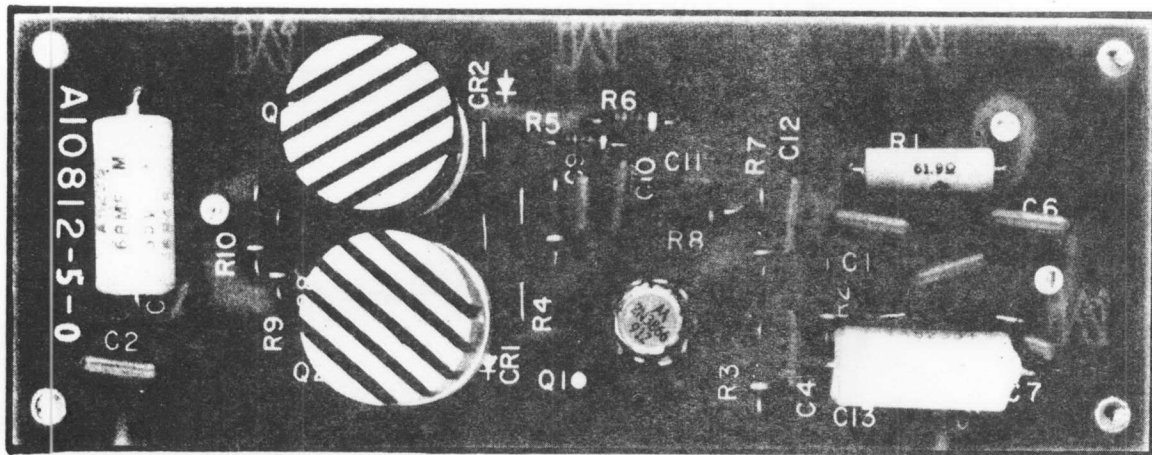
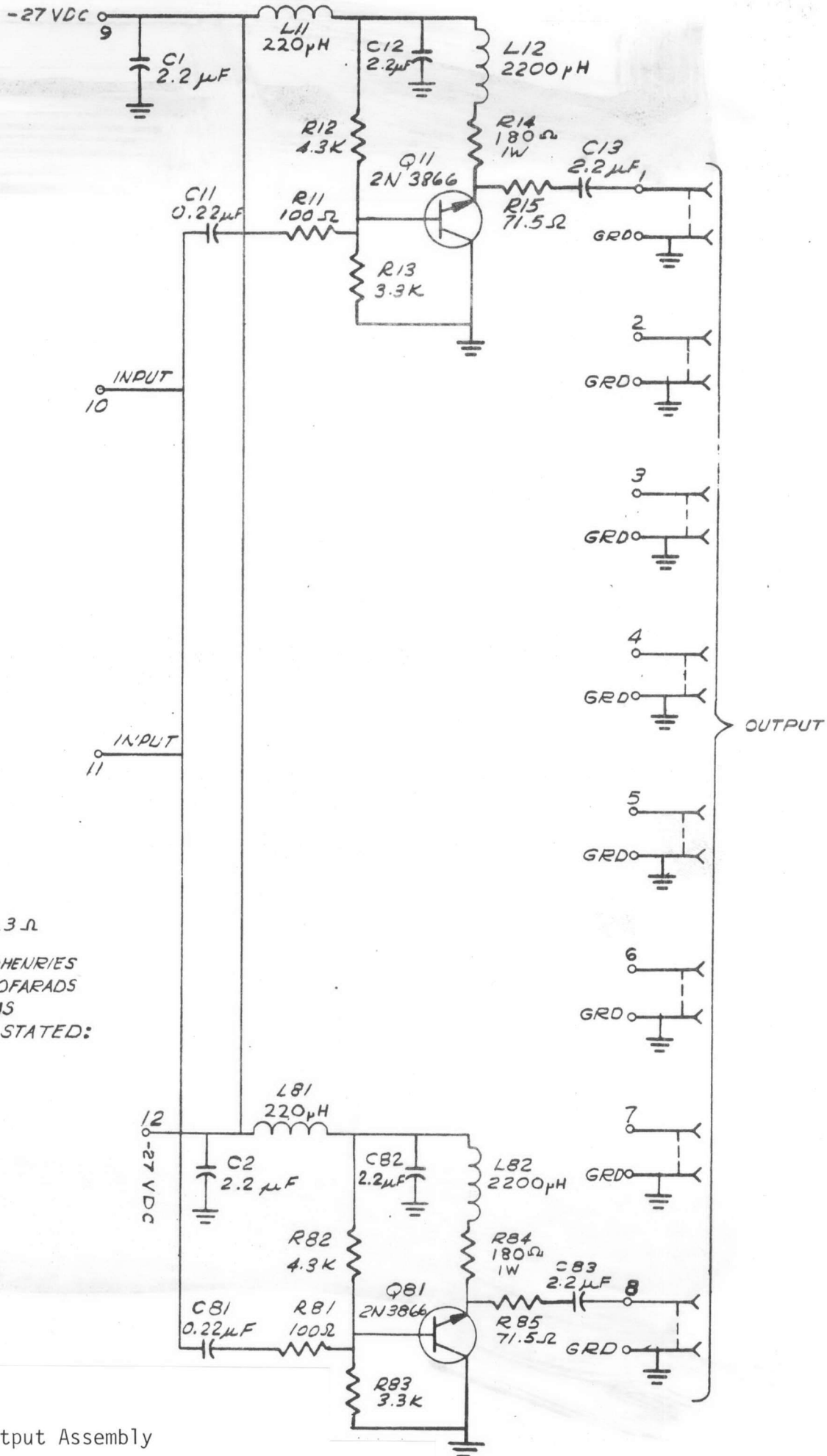


Figure 7.3 Preamplifier Assembly Component Location



2. R15 & R85 TO BE 52.3 Ω
 FOR A10791-6
 INDUCTANCE IN MICROHENRIES
 CAPACITANCE IN MICROFARADS
 RESISTANCE IN OHMS
 1. UNLESS OTHERWISE STATED:
 NOTES

Figure 7.4 Output Assembly

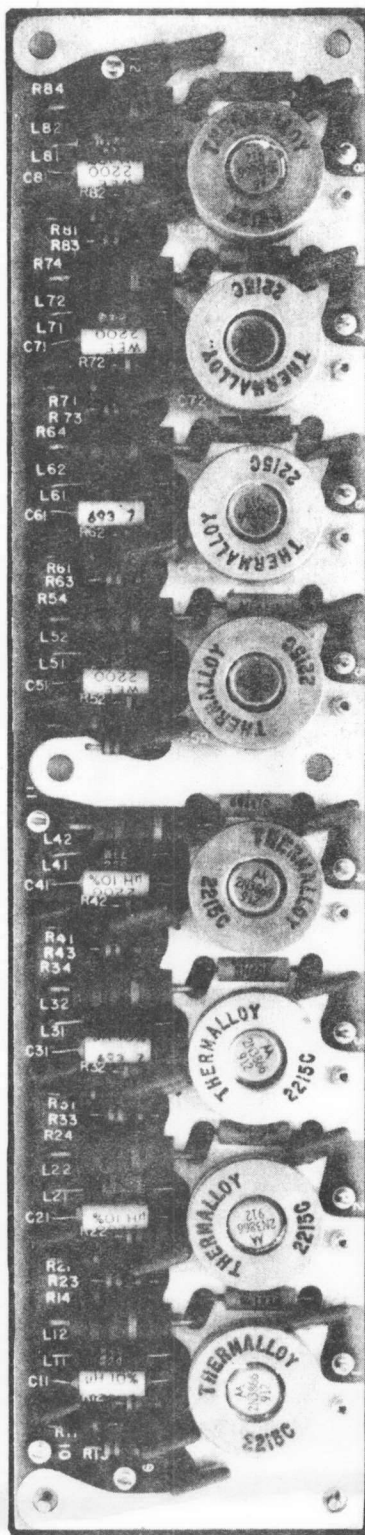


Figure 7.5 Output Assembly
Component Location

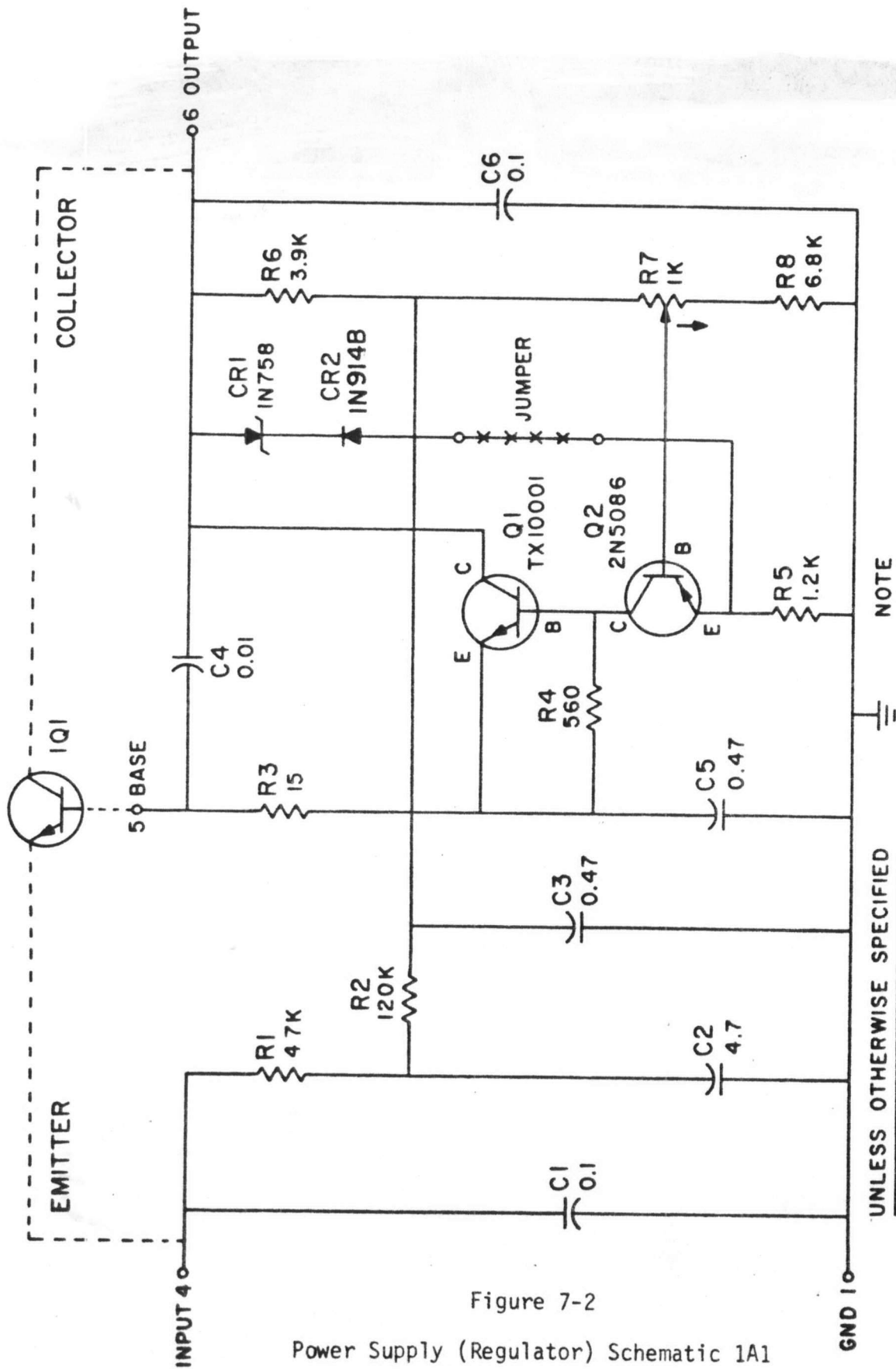


Figure 7-2
Power Supply (Regulator) Schematic 1A1

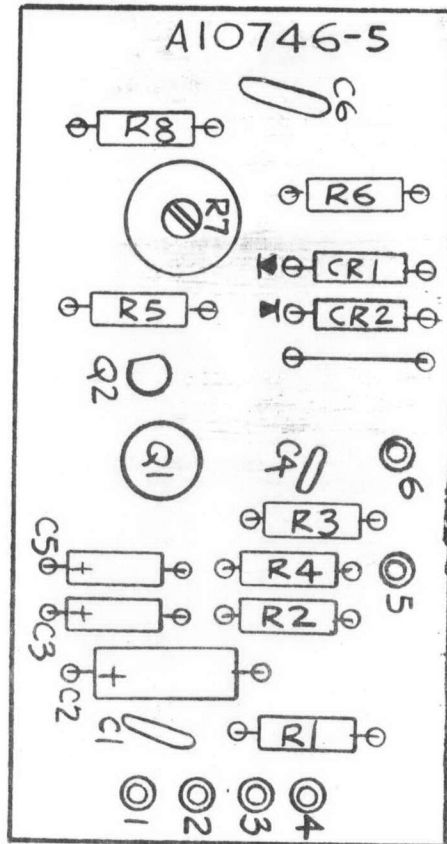
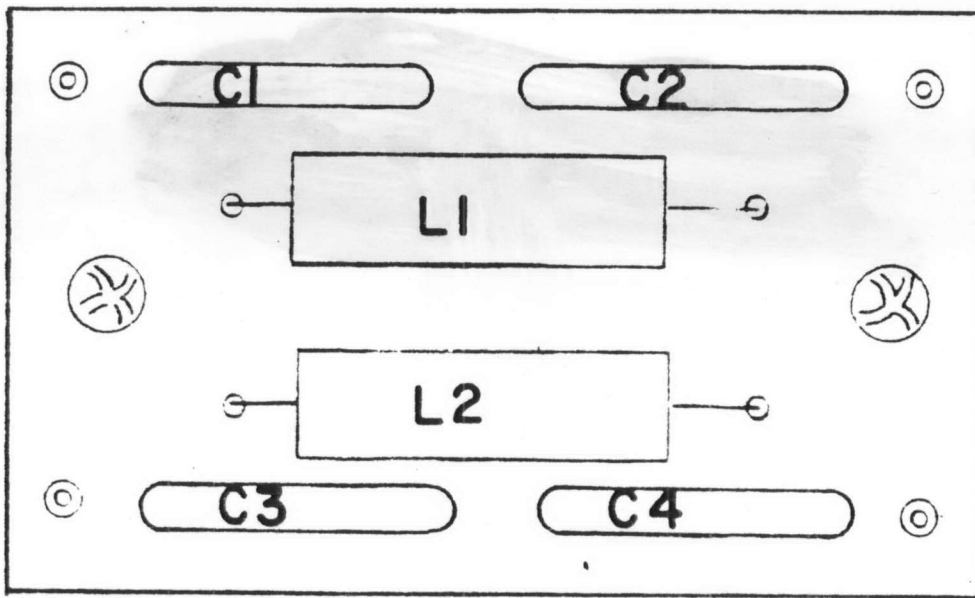


Figure 7.7 Regulator Assembly Component Location



A5780
(FLI)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1,C2 C3,C4	CAPACITOR: Fixed	CC100-32
L1,L2	COIL: Fixed	CL105-1

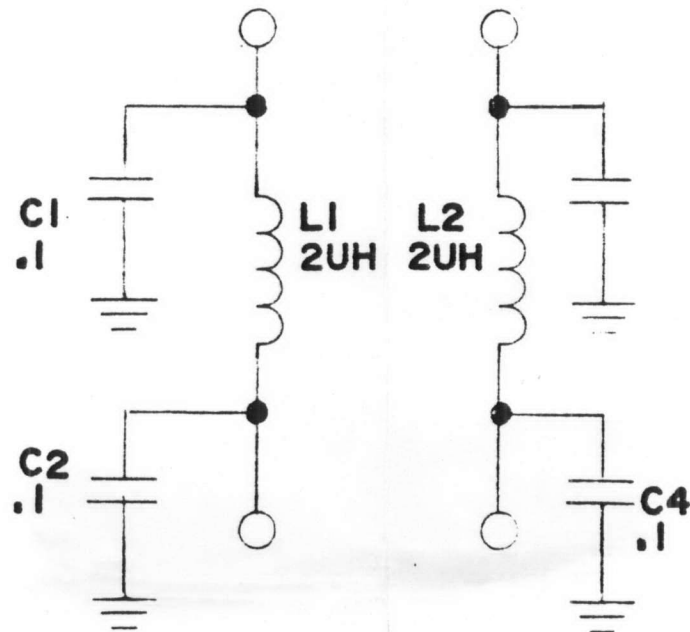
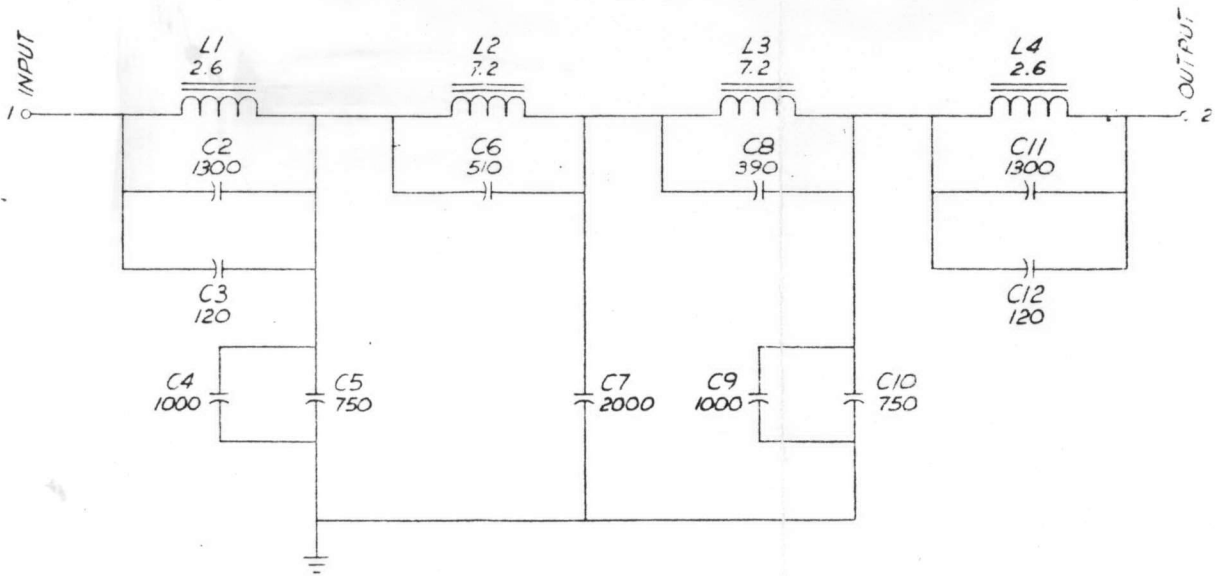
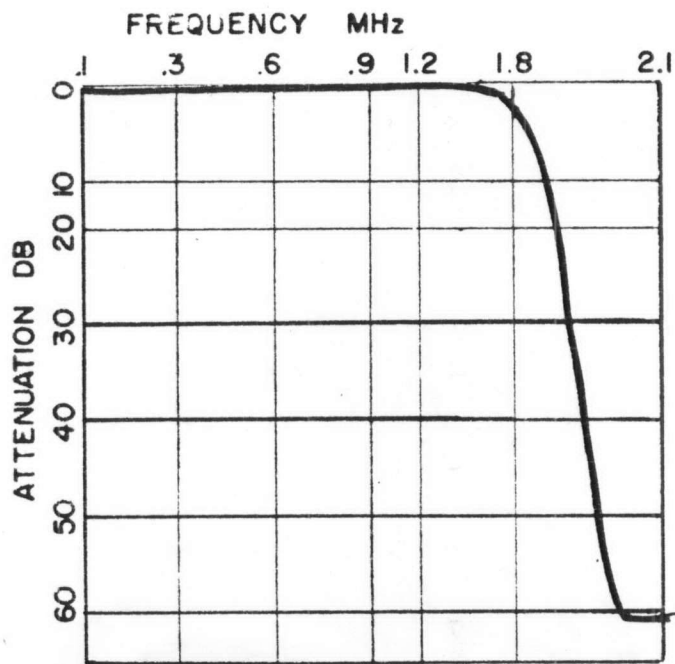


Figure 7.8 Line Filter Assembly

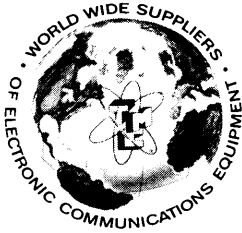


C12	L4		C1	
LAST COMP USED			MISSING COMP	



TYPICAL FREQUENCY RESPONSE
(FX 10022)

Figure 7.9 Low Pass Filter Assembly



PLEASE READ THIS FIRST

Dear TMC Product User:

Thank you for purchasing the TMC Model LMC-8 Receiving Antenna Multicoupler. This model is one of a series of six different types that provide RF distribution from one or two receiving antennas to up to thirty-two communications receivers, simultaneously. The LMC-8 provides the capability of coupling eight receivers to a single antenna, each with a nominal gain from antenna to receiver of 2dB. The LMC-8 operates from 10KHz to 5MHz depending on the input filters installed. Several such filters are available, including a low pass type with the high-end cut-off at 2MHz and a broadcast stopband filter to suppress unwanted signals in the commercial broadcast frequency range. Additional filters allow operation of the multicoupler to 40MHz. Other models feature multiple antenna inputs each to sixteen communication receivers.

The antenna multicoupler is described in detail in the enclosed technical manual. Product bulletins and application notes, as appropriate to the LMC-8, are also included. These publications provide important information about using TMC equipment. Please read them.

Since the LMC-8 requires mating connectors and coaxial cables to operate properly, a catalog on TMC's connector products is included. If you need additional data or some specific technical information, please give our Customer Service a call at (914) 698-4800 or return the business reply card provided in this package. Our FAX (facsimilie) number is (914) 698-4805 and our TELEX number is 137-358 TECHMAT MECK.

If you are missing any items, please contact TMC directly or through your local sales office.

Thank you for selecting the TMC Model LMC-8 antenna multicoupler.

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| <input type="checkbox"/> Computer Monitor and Control Products | <input type="checkbox"/> Antenna Systems |
| <input type="checkbox"/> RF Connector Products | <input type="checkbox"/> Test and Terminal Equipment |

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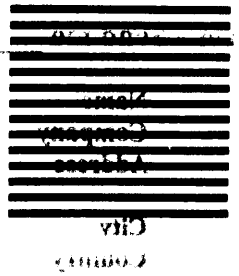


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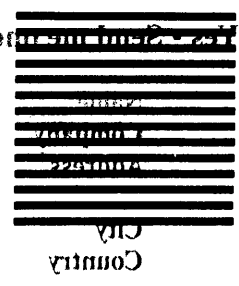


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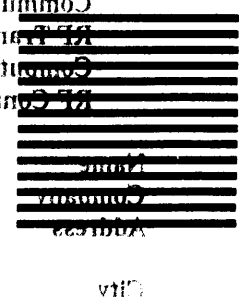


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Some of our Customers . . .

Communications equipment manufactured by TMC has been purchased for use in a large number of organizations and countries throughout the free world. In addition, TMC is a large-volume producer of communications equipment for the worldwide commercial, government and defense markets. Active sites using TMC products are depicted on the world locator map. A partial list of customers indicates how widely accepted TMC products and services have become.

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Greece, Italy, Switzerland, Spain, Portugal, Turkey, Kenya, Morocco, Liberia, Saudi Arabia, Pakistan, Korea, Indonesia, Canada, United States, Australia, Papua New Guinea, New Zealand, Nepal, Singapore, Thailand

Civil Aviation Agencies

Belgium, France, Spain, Greece, Chile, Brazil, Turkey, Italy, Pakistan, Algeria, Saudi Arabia, Liberia, Kenya, Zambia, Canada, United States, Phillipines

The United Nations

NATO Procurement Agencies (Europe)

International Corporations

American Telephone & Telegraph (ATT), International Telephone & Telegraph (ITT), General Telephone & Electronics (GTE), Contel-Page Communications, Marconi, Racal, Rockwell International/Collins, Harris/RF Communications, General Electric/RCA, Raytheon Service, Bell Canada, Arabian-American Oil (Aramco), Air Canada, Pan American Airways, Continental Electronics, Thomson CSF, General Dynamics, Lockheed Aircraft, Sandia, Western Electric

Military and Defense Forces

Norway, Denmark, West Germany, Belgium, France, Italy, Spain, Portugal, Greece, Turkey, United Kingdom, Algeria, Saudi Arabia, Nigeria, Kenya, Pakistan, United States, Canada, Thailand, New Zealand, Australia, India

Complete Families of TMC Products

COMMUNICATIONS EQUIPMENT

Systems	SYM			Transportable/Contingency Communications
Transmitters	GPT	HFT		High Frequency Sideband Transmitters
	LFT	MFT	BCT	Broadcast, LF and MF Transmitters
Exciters	MMX	LFE	SBG	Multi-mode LF/MF/HF Synthesized Exciters
	STE	SME		Multi-mode Multi-Channel Exciters
Receivers	GPR	STR	SMR	Synthesized and Multi-Channel Receivers
Transceivers	TTR			High Frequency Synthesized Transceivers

COMPUTER PRODUCTS

Remote Control	TCR	TCS	RMC	Remote Monitor and Control Systems
Security Systems	SCS			Security Monitor and Control Systems
Software	TMC			Network Monitor and Control Software

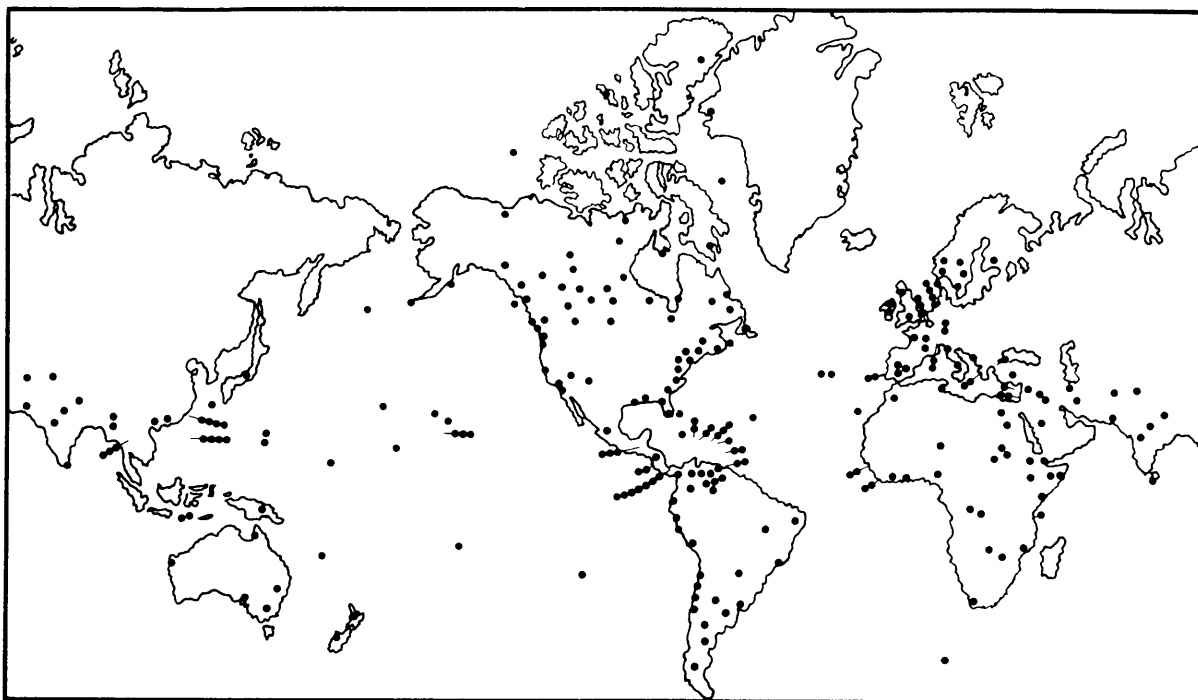
ANTENNA PRODUCTS

Antennas	ARA	VRA	VTA	Vertical Receiving/Transmitting Antennas
	DPA	RBA	SVA	Dipole, Rhombic, Sloping-V Antenna Systems
	VDA	VOA		Directional/Omnidirectional VHF Antennas
Tuners	ATS	ATU	MAT	Antenna Tuners and Tuning Systems
Couplers	RAC	TRC	DAC	Receiving/Transmitting Antenna Couplers
Multicouplers	AMC	LMC	VMC	Receiving Antenna Multicouplers
Filters	LPF	RFP	TFP	Low Pass, Harmonic and Receiving Filters

CONNECTOR PRODUCTS

Patch Panels	SPP	QDP	JPP	Switching/Quick-Disconnect Patch Panels
RF Conn ctors	CA	AX	TCA	RF Cables and Connector Assemblies
	PL	ES	SW	Plugs, Switches, End Seal Assemblies

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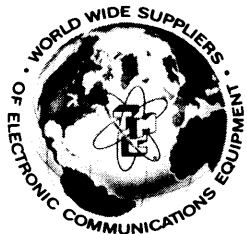
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