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TECHNICAL MANUAL

MF/HF Receiving Antenna Multicoupler

Model AMC-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.

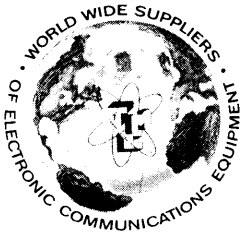
Customer Support

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.



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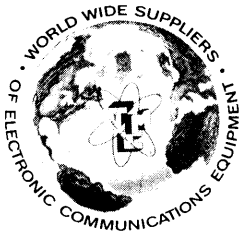
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Model AMC-8

THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS



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.

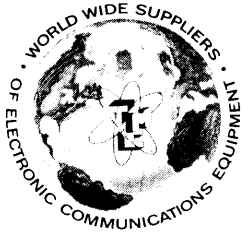
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THE TECHNICAL MATERIEL CORPORATION
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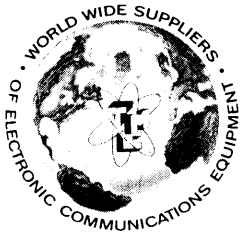
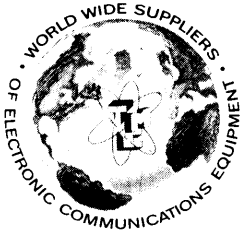


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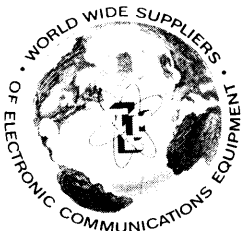


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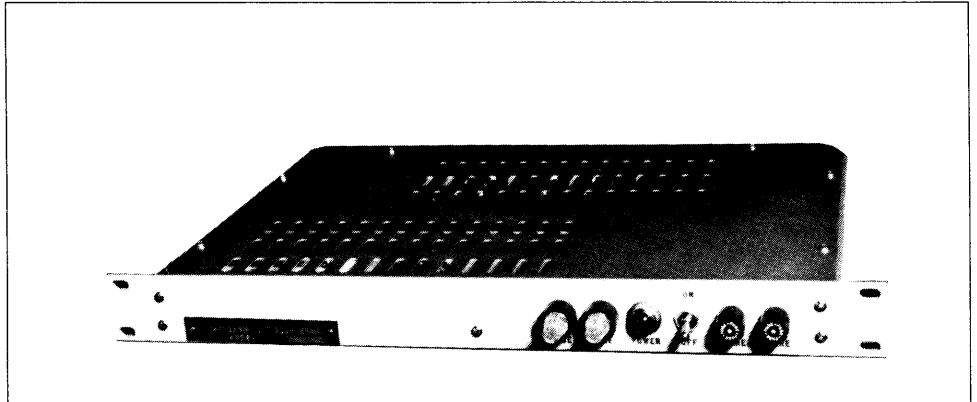
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Model AMC-8

One Common RF Antenna Input
Eight MF/HF RF Outputs

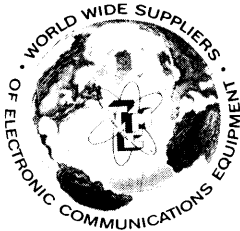


Model AMC-16

One Common RF Antenna Input
Sixteen MF/HF RF Outputs

Model AMC-32

One Common RF Antenna Input
Thirty-two MF/HF RF Outputs



Section 1 - General Description

1.1 Functional Description

1.1.1 Overview

The AMC-8 MF/HF Antenna Multicoupler is a broadband coupling unit, used for coupling up to eight medium/high 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 100KHz to 40MHz. 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 AMC-8 is fixed. Eight MF/HF 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 AMC-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 AMC-8 are listed in Table 1.1.

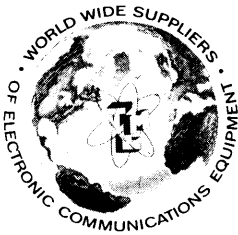


Table 1.1 - Semiconductor and Intergrated Circuit Complement

Power Supply and Regulator

Rectifier Bridge	NW10005
Bias Regulator	1N758A
Bias Regulator	1N456A
Current Regulator	TX10001
Voltage Regulator	2N5086
Voltage Regulator	2N3055

Preamplifier and Output Circuits

Bias Regulator	1N456A
Buffer	2N3866
Current Amplifier	2N5160

1.3 Technical Specifications

Frequency Range

100KHz-40MHz no filter; 2-32MHz with bandpass filter; 2-40MHz with high pass filter; other filters including broadcast stopband filter are available.

Number of Outputs

Eight MF/HF 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-3MHz

Offband Rejection

Greater than -60dB, 10-100KHz, depending on filter. Greater than -30dB, 46-1000MHz.

Noise Figure

Less than +7dB, nominally +5dB.

Output/Output Isolation

Greater than -40dB

Output/Input Isolation

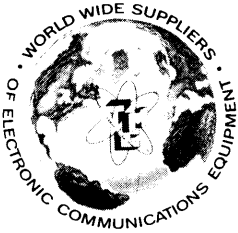
Greater than -55dB

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 (AMC-8).

Operating Features

Cooling

Convection, no fans or moving parts

Ambient Conditions

0°C to +50°C; 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

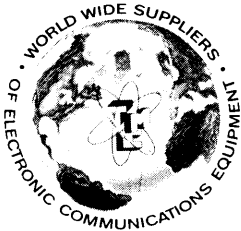
Indicating fuseholders display status of primary power circuits

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

AMC Product Group

AMC-2X4 Dual MF/HF Receiving Antenna Multicoupler, 2X4 Outputs
AMC-2X8 Dual MF/HF Receiving Antenna Multicoupler, 2X8 Outputs
AMC-2X16 Dual MF/HF Receiving Antenna Multicoupler, 2X16 Outputs

AMC-8 MF/HF Receiving Antenna Multicoupler, Eight Outputs
AMC-16 MF/HF Receiving Antenna Multicoupler, 16 Outputs
AMC-32 MF/HF Receiving Antenna Multicoupler, 32 Outputs

AMC-21-4 MF/HF Receiving Antenna Multicoupler, Four Outputs
AMC-21-8 MF/HF Receiving Antenna Multicoupler, Eight Outputs
AMC-21-12 MF/HF Receiving Antenna Multicoupler, 12 Outputs
AMC-21-16 MF/HF Receiving Antenna Multicoupler, 16 Outputs

500-Series Options:

- 500 50-ohm operation, no input filter
- 502 50-ohm operation, low-pass input filter
- 504 50-ohm operation, broadcast stopband filter
- 505 50-ohm operation, bandpass filter, 2-32MHz
- 524* 50-ohm operation - Includes Options 502 & 504 (switched)
- 525* 50-ohm operation - Includes Options 502 & 505 (switched)
- 545* 50-ohm operation - Includes Options 504 & 505 (switched)
- 5X3* 50-ohm operation - Includes Options 502, 504 & 505 (switched)
- Other filters are available to suit specific applications.

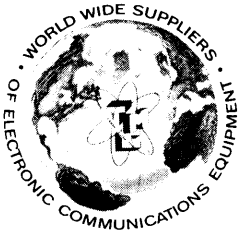
700-Series Options:

- 700 70-ohm operation, no input filter
- 702 70-ohm operation, low-pass input filter
- 704 70-ohm operation, broadcast stopband filter
- 705 70-ohm operation, bandpass filter, 2-32MHz
- 724* 70-ohm operation - Includes Options 702 & 704 (switched)
- 725* 70-ohm operation - Includes Options 702 & 705 (switched)
- 745* 70-ohm operation - Includes Options 704 & 705 (switched)
- 7X3* 70-ohm operation - Includes Options 702, 704 & 705 (switched)
- Other filters are available to suit specific applications.

* Available in Model AMC-21 series only.

- Note: Input filters may be combined in AMC-2X and AMC-21 series only.

When ordering, specify both model and option. Example: AMC-8/504



Section 2 - Installation

2.1 Initial Inspection

2.1.1 General

Every AMC-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 AMC-8 operates from a 115VAC, 48 to 400Hz power source. Optionally, the AMC-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 AMC-8 after it has been installed in an equipment rack:

Antenna

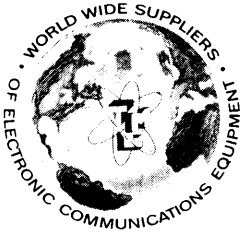
The antenna cable must be fitted with a connector that mates with the AMC-8 connectors provided. Normally, this is a BNC-type connector, although such connectors as type N are also available. This antenna cable is then connected to ANTENNA INPUT jack 1J1 on the rear panel of the AMC-8.

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 AMC-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 AMC-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 AMC-8 reduces heat problems, allowing "stacking" of up to five AMC-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

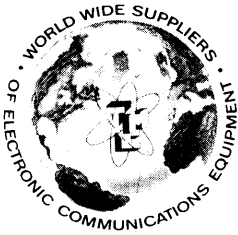
2.3.1

General

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

Table 2.1 - Loose Items Supplied

CA10505	Power Cable Assembly	1 each
203010	Technical Manual	1 each
UGxx	Mating Connectors	Optional extra



Section 3 - Operation

3.1 General

3.1.1 Controls

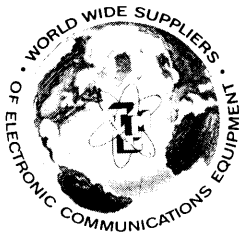
Table 3.1 contains a list of the operating controls and indicators that are located on the front panel of the AMC-8.

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 AMC-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 AMC-8 Medium/High Frequency Antenna Multicoupler is a broadband antenna distribution system, designed to couple one MF/HF antenna to the antenna inputs of up to eight communication receivers.

4.1.2 Input/Output

Both the input and output impedance of the AMC-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 100KHz to 40MHz.

4.1.3 Salient Performance Features

The AMC-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 AMC-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.

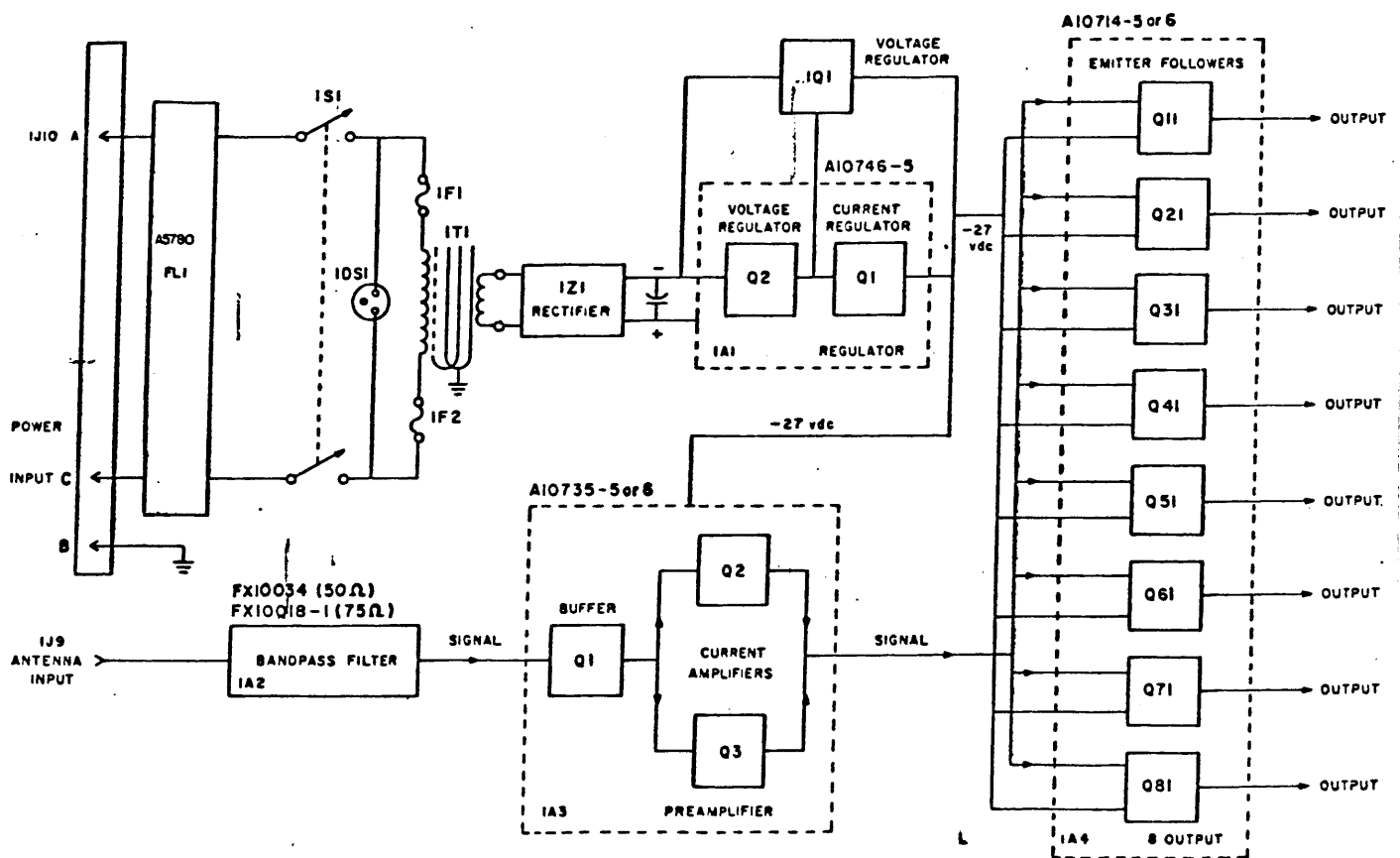


Figure 4.1 SYSTEM BLOCK DIAGRAM

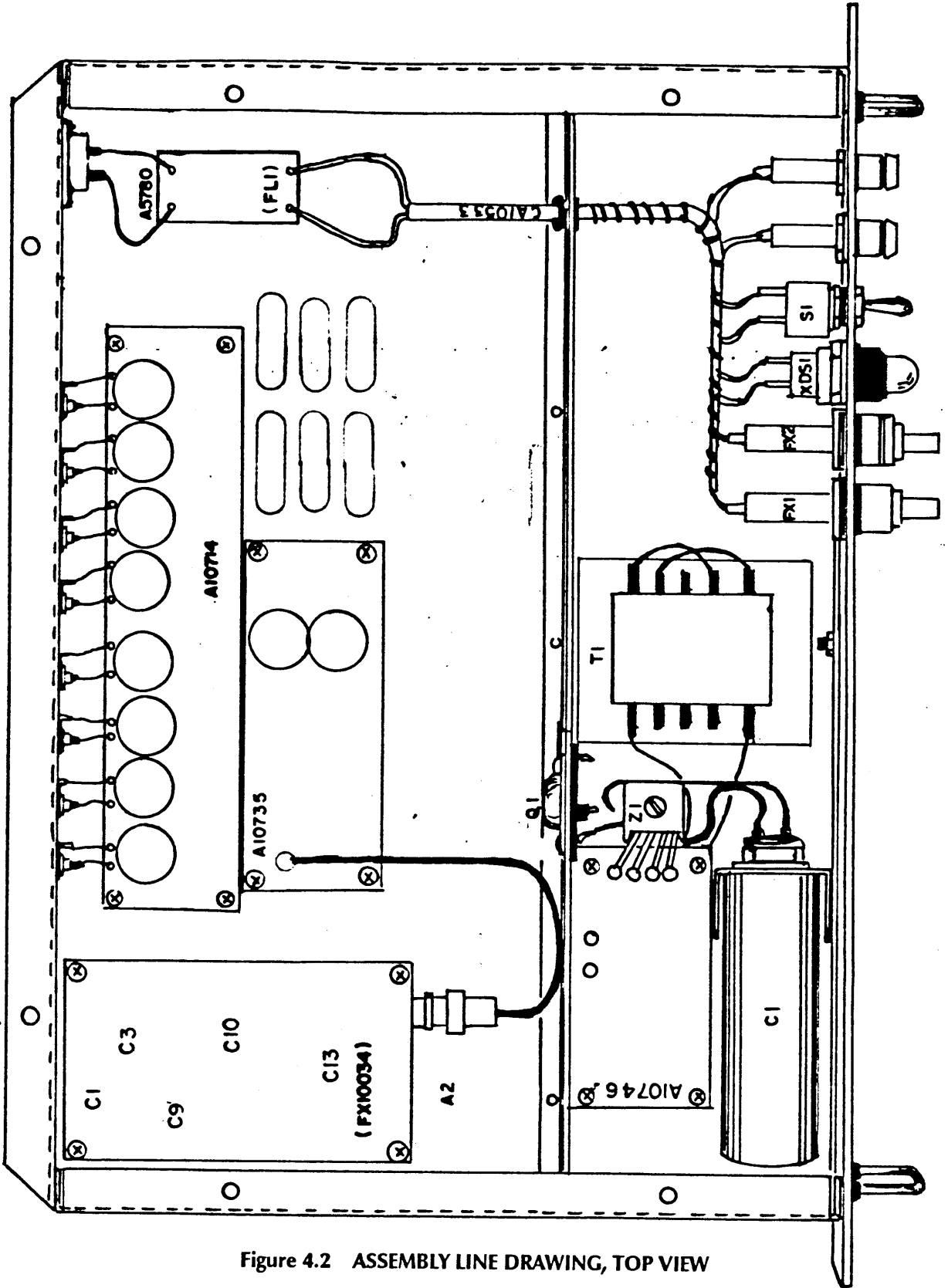


Figure 4.2 ASSEMBLY LINE DRAWING, TOP VIEW

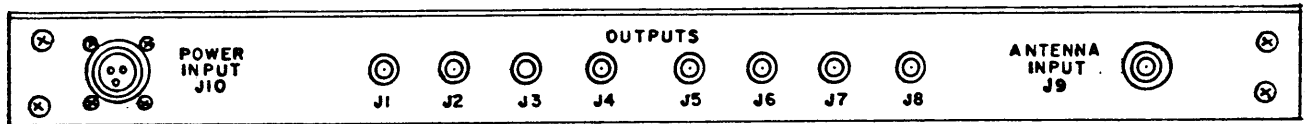
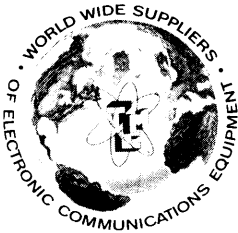


Figure 4.3 ASSEMBLY LINE DRAWING, REAR VIEW



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.

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

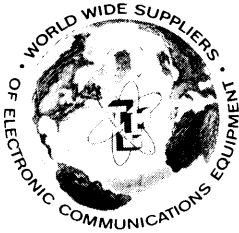
Circuit Analysis

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.



Section 5 - Maintenance

5.1 General

5.1.1 Test Equipment Requirements

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

5.3 Troubleshooting

5.3.1 General Failure Symptoms

During operation of the AMC-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 provides a guide to locating and correcting the possible failures.

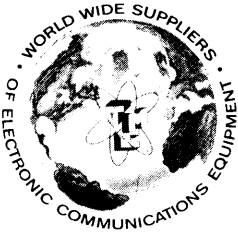


Table 5.1 - Troubleshooting Procedures

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, checking indicating type fuses 1F1/1F2 and replace with spare if necessary. If both fuses are intact, proceed to check of 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.

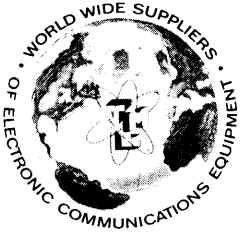


Table 5 - Troubleshooting (Continued)

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.

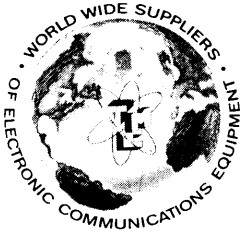
5.5 Adjustments

5.5.1 Output Voltage Trim

Only one adjustment may be required in the AMC-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)
FX10034	Band Pass Filter Assembly

AMC-8A
MAIN CHASSIS, FRONT & REAR PANELS

REF DESIGNATION	DESCRIPTION	TMC PART NUMBER
A1	VOLTAGE REGULATOR	A10746-5
A2	PREAMPLIFIER, 75 ohms	A10735-5
A2	PREAMPLIFIER, 50 ohms	A10735-6
A3	OUTPUT MODULE: 8 outputs, 75 ohms	A10714-5
A3	OUTPUT MODULE: 8 outputs, 50 ohms	A10714-6
A4	FILTER: BANDPASS, 75 ohms	FX10018
A4	FILTER: BANDPASS, 50 ohms	FX10034
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
RI	RESISTOR, FXD	RW111-3
S1	SWITCH: Toggle	ST22K
* T1, T2	TRANSFORMER: Power	A5782
TB1	TERMINAL BOARD	TM102-2
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, 2.9K, $\frac{1}{2}$ 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

PREAMPLIFIER ASSEMBLY
A10735-5, A10735-6

REF. DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1, C6, C7	CAPACITOR: Fixed, ceramic 0.1 uF	CC10015-X5V104M
C2	CAPACITOR: Fixed, mica 47 pF, 2% (used only in A10735-5)	CM104ED470G03
C3, C4, C5, C8, C9	CAPACITOR: Fixed, ceramic .01 uF	CC10017-X5V103M
CR1	DIODE	1N914B
* R1	RESISTOR: Fixed, film 910 ohms, $\frac{1}{2}$ W, 2% (A10735-5)	RL07S911G
R1	RESISTOR: Fixed, film, 510 ohms $\frac{1}{2}$ W, 2% (A10735-6)	RL07S511G
R2	RESISTOR: Fixed, film 8.2 K, $\frac{1}{2}$ W, 2%	RL07S822G
R3	RESISTOR: Fixed, film 3K, $\frac{1}{2}$ W, 2%	RL07S302G
R4	RESISTOR: Fixed, comp, 330 ohms, $\frac{1}{2}$ W, 5%	RC20GF331J
R5, R7	RESISTOR: Fixed, film 2K, $\frac{1}{2}$ W, 2%	RL07S202G
R6	RESISTOR: Variable, 500 ohms	RV10009-501AP
R8, R9	RESISTOR: Fixed, comp, 7.5 ohms, $\frac{1}{2}$ W, 5%	RC07GF7R5J
L1	INDUCTOR: RF coil, 33 uH	CL275-330
L2	INDUCTOR: RF coil, 0.33 uH (used only in A10735-5)	CL10044
L3, L4, L5	INDUCTOR: RF coil, 220 uH	CL275-221
T1	TRANSFORMER: RF	TR10005
L6	INDUCTOR, RF COIL 1.5 UH	CL500
Q1, Q2	TRANSISTOR	2N5160
Q3	TRANSISTOR	2N3866

8 OUTPUT ASSEMBLY
A10714 - 5 and -6

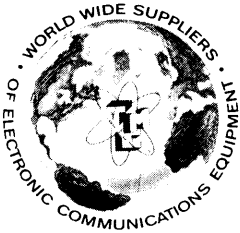
REF. DESIGNATION	DESCRIPTION	TMC PART NUMBER
C1, C2, C12, C13, C22, C23, C32, C33, C42, C43, C52, C53, C62, C63, C72, C73, C82, C83	CAPACITOR: Fixed, mica 0.1 uF	CC10015-X5V104M
C11, C21, C31, C41, C51, C61, C71, C81	CAPACITOR: Fixed, mica, 0.01 uF	CC10017-X5V103M
L11, L21, L31, L41, L51, L61, L71, L81	INDUCTOR: RF coil, 33 uH	CL275-330
L12, L22, L32, L42, L52, L62, L72, L82	INDUCTOR: RF coil, 220 uH	CL275-221
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 220 ohms, 1W, 5%	RC32GF221J
*R15, R25, R35, R45, R55, R65, R75, R85	RESISTOR: Fixed, film 71.5 ohms, $\frac{1}{2}$ W, 1%	RNG0D71R5F
Q11, Q21, Q31, Q41, Q51, Q61, Q71, Q81	TRANSISTOR	2N3866

*The value of R15 and R85 for -6 is 51.3 ohms

BANDPASS FILTER FX10034* ASSEMBLY 1A2

REF DESIGNATION	DESCRIPTION	TMC PART NUMBER
1A2C1	CAPACITOR	CV112-6
1A2C2	CAPACITOR	CM04ED820G03
1A2C3	SAME AS 1A2C1	
1A2C4	CAPACITOR	CM04CD050D03
1A2C5	CAPACITOR	CM06FD132F03
1A2C6	SAME AS 1A2C2	
1A2C7	CAPACITOR	CM04FD101J03
1A2C8	SAME AS 1A2C4	
1A2C9	SAME AS 1A2C1	
1A2C10	SAME AS 1A2C1	
1A2C11	CAPACITOR	CM04ED270G03
1A2C12	CAPACITOR	CM06FD132F03
1A2C13	SAME AS 1A2C1	
1A2C14	CAPACITOR	CM04ED680G03
1A2DS1	LAMP	BI10005
1A2J1	CONNECTOR	UG290A/U
1A2J2	SAME AS 1A2J1	
1A2L1	INDUCTOR	CL10050-2
1A2L2	INDUCTOR	CL10051-1
1A2L3	INDUCTOR	CL10050-5
1A2L4	INDUCTOR	CL10050-1
1A2L5	INDUCTOR	CL10051-2
1A2L6	INDUCTOR	CL10050-4
1A2L7	INDUCTOR	CL10050-3

* See figure 7-3 for FX10018-1 (75 Ω)



Section 7 - Schematic Diagrams

- Figure 7.1 Overall Schematic Diagram**
- Figure 7.2 Schematic Diagram, Preamplifier Assembly**
- Figure 7.3 Component Location, Preamplifier Assembly (1A3)**
- Figure 7.4 Schematic Diagram, Output Amplifier Assembly**
- Figure 7.5 Component Location, Output Amplifier Assembly (1A4)**
- Figure 7.6 Schematic Diagram, Regulator Assembly**
- Figure 7.7 Component Location, Regulator Assembly (1A1)**
- Figure 7.8 Schematic Diagram, Line Filter Assembly**
- Figure 7.9 Schematic Diagram, Bandpass Filter Assembly**
- Figure 7.10 Component Location, Bandpass Filter Assembly (FX100034)**
- Figure 7.11 Schematic Diagram, Broadcast Stopband Filter Assembly**
- Figure 7.12 Component Location, Broadcast Stopband Filter Assembly (FX100020)**
- Figure 7.13 Schematic Diagram, High pass Filter Assembly**
- Figure 7.14 Component Location, High pass Filter Assembly (FX100021)**
- Figure 7.15 Schematic Assembly, Low pass Filter Assembly**
- Figure 7.16 Component Location, Low pass Filter Assembly (FX100022)**

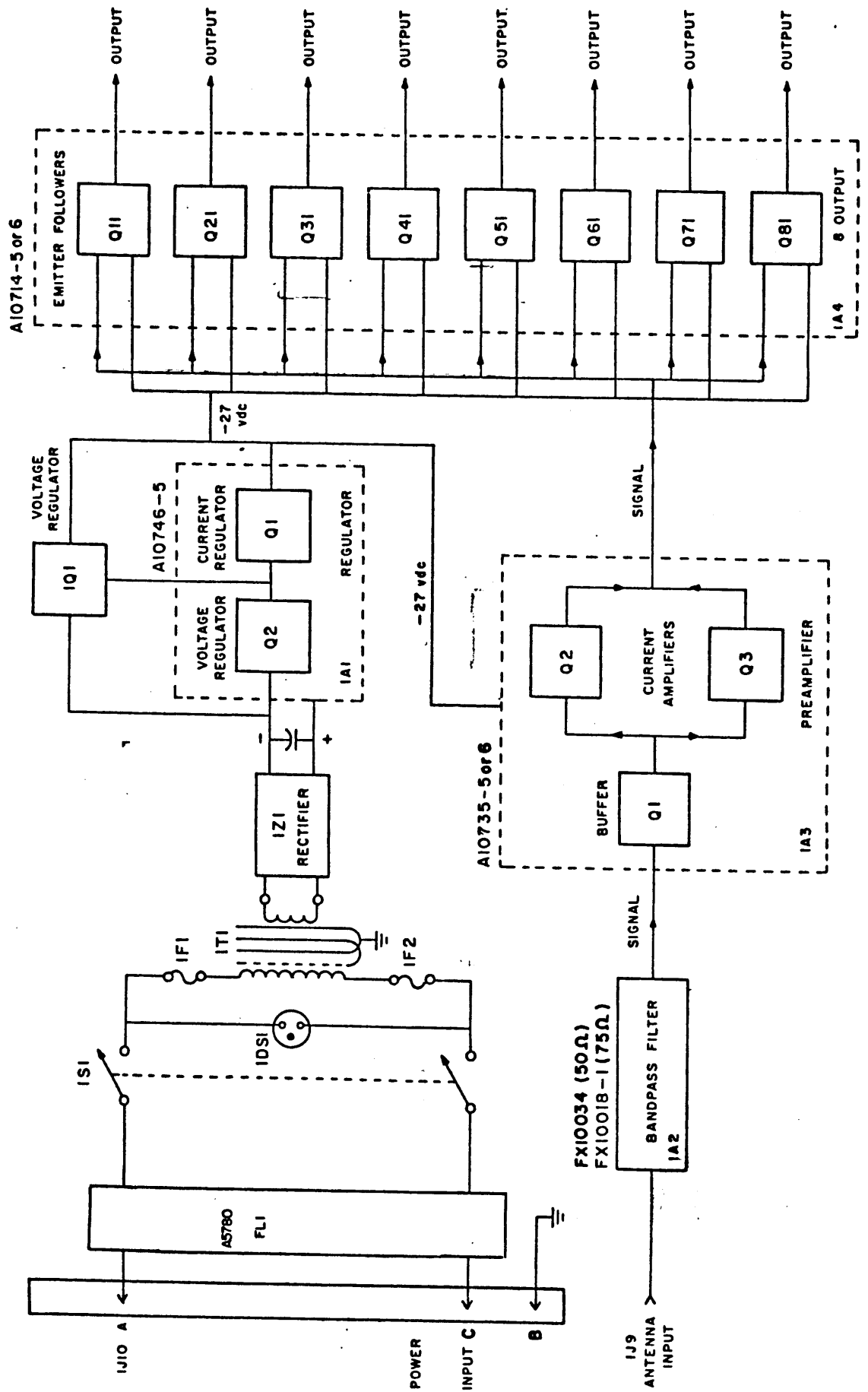
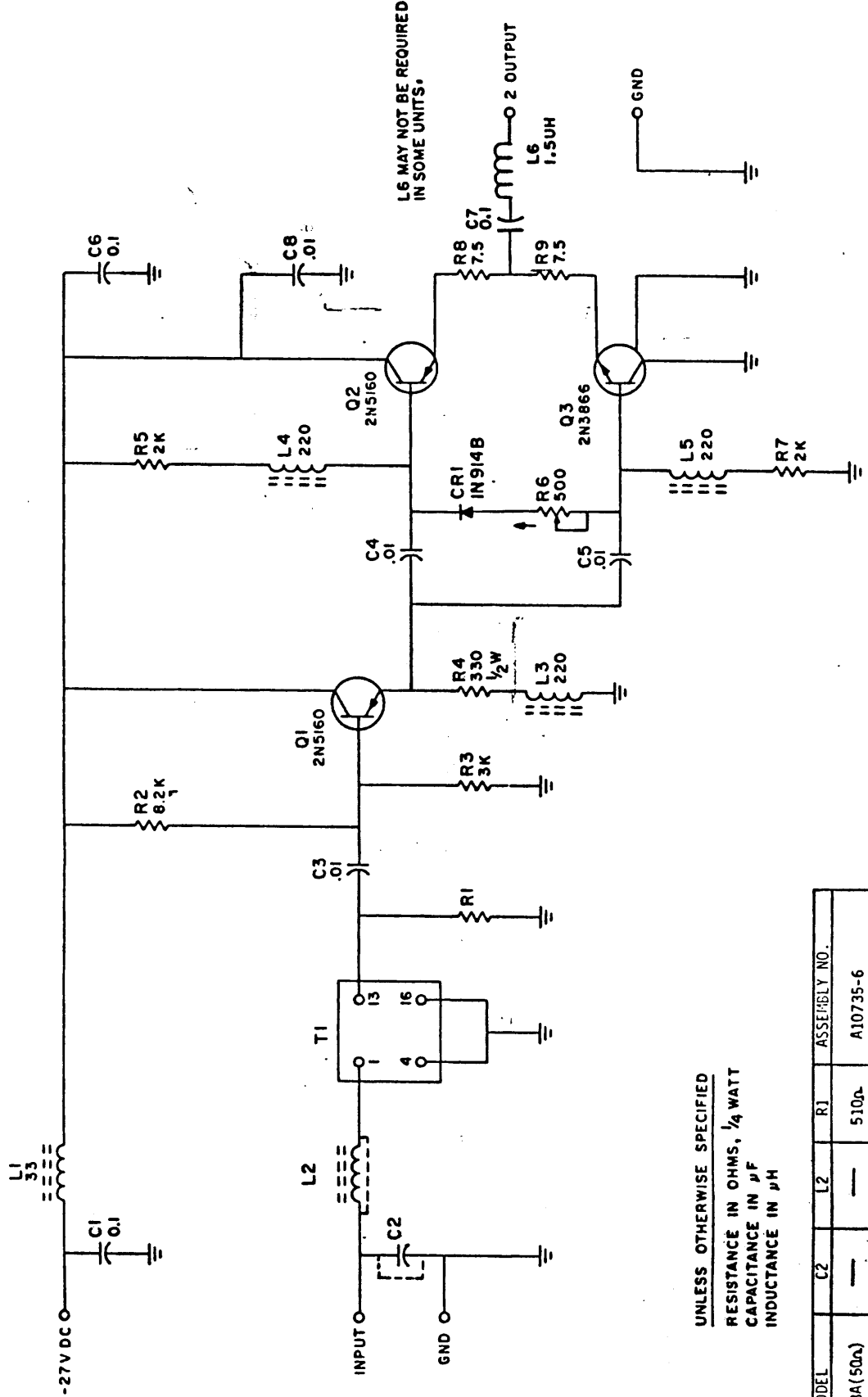


Figure 7.1 OVERALL SCHEMATIC DIAGRAM



UNLESS OTHERWISE SPECIFIED
 RESISTANCE IN OHMS, 1/4 WATT
 CAPACITANCE IN μ F
 INDUCTANCE IN μ H

MODEL	C2	L2	R1	ASSEMBLY NO.
AMC-8A(50 Ω)	---	---	510 Ω	A10735-6
AMC-8A(75 Ω)	47pf	.33uh	910 Ω	A10735-5

Figur 7.2 SCHEMATIC DIIAGRAM, PREAMPLIFIER ASSEMBLY (1A3)

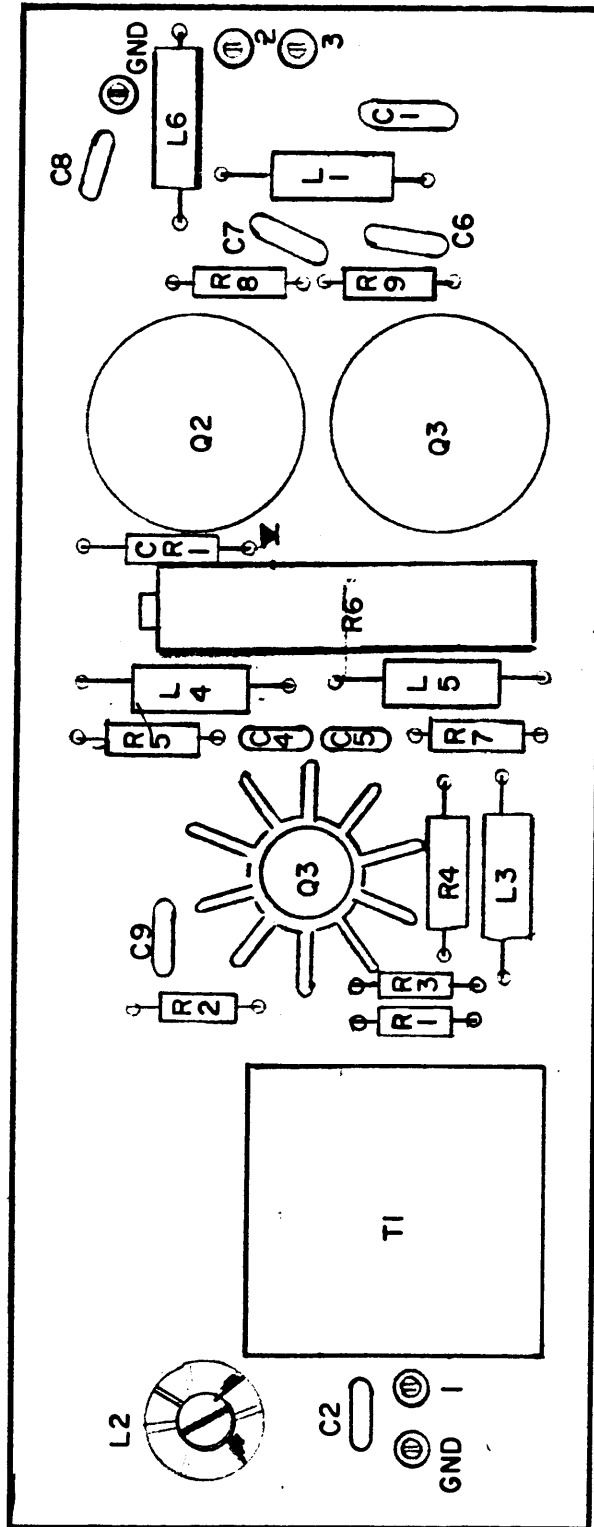
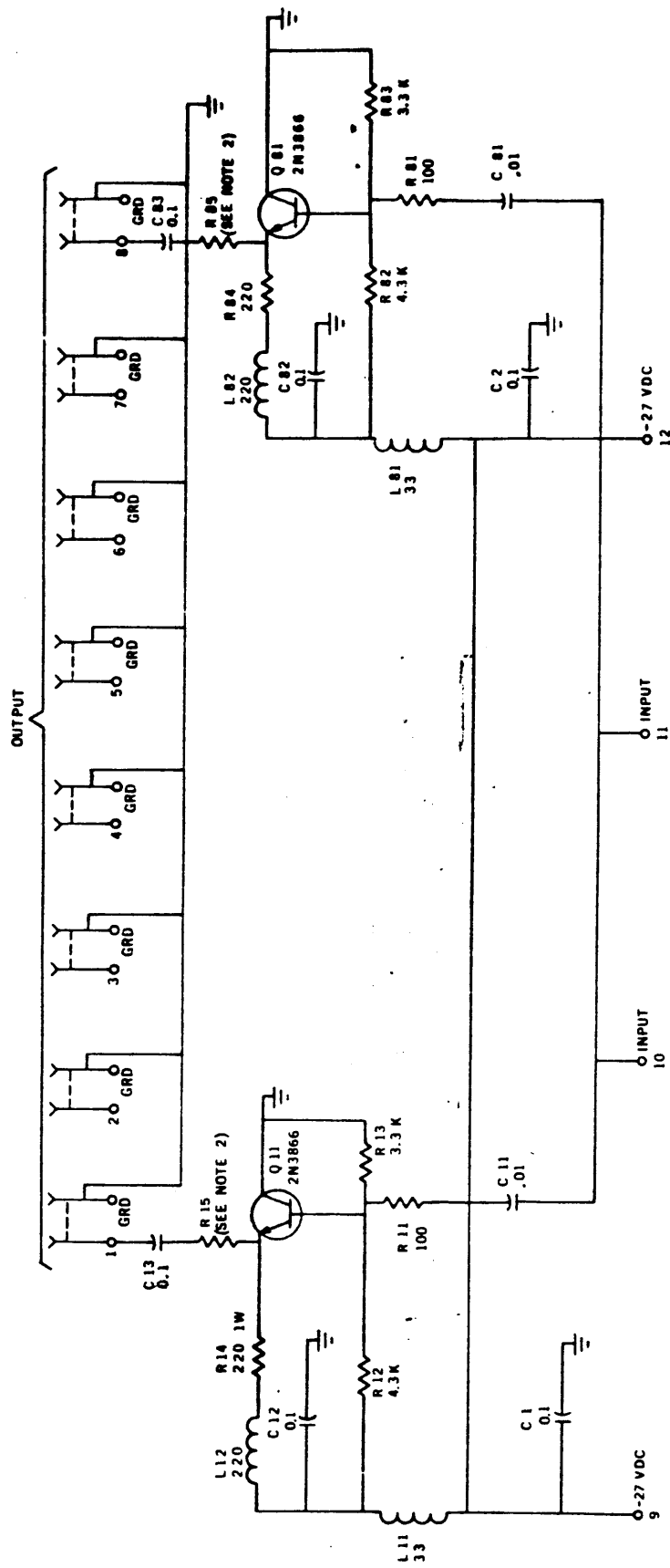


Figure 7.3 COMPONENT LOCATION, PREAMPLIFIER ASSEMBLY



MODEL	R 15		R 85		ASSEMBLY NO
	50 Ω	75 Ω	50 Ω	75 Ω	75 Ω
AMC 8	52.3	71.5	52.3	71.5	A-10714-6
					A-10714-5

2

INDUCTANCE IN MICROHENRIES
CAPACITANCE IN MICROFARADS
RESISTANCE IN OHMS
UNLESS OTHERWISE STATED:

Figure 7.4 SCHEMATIC DIAGRAM, OUTPUT AMPLIFIER ASSEMBLY (1A4)

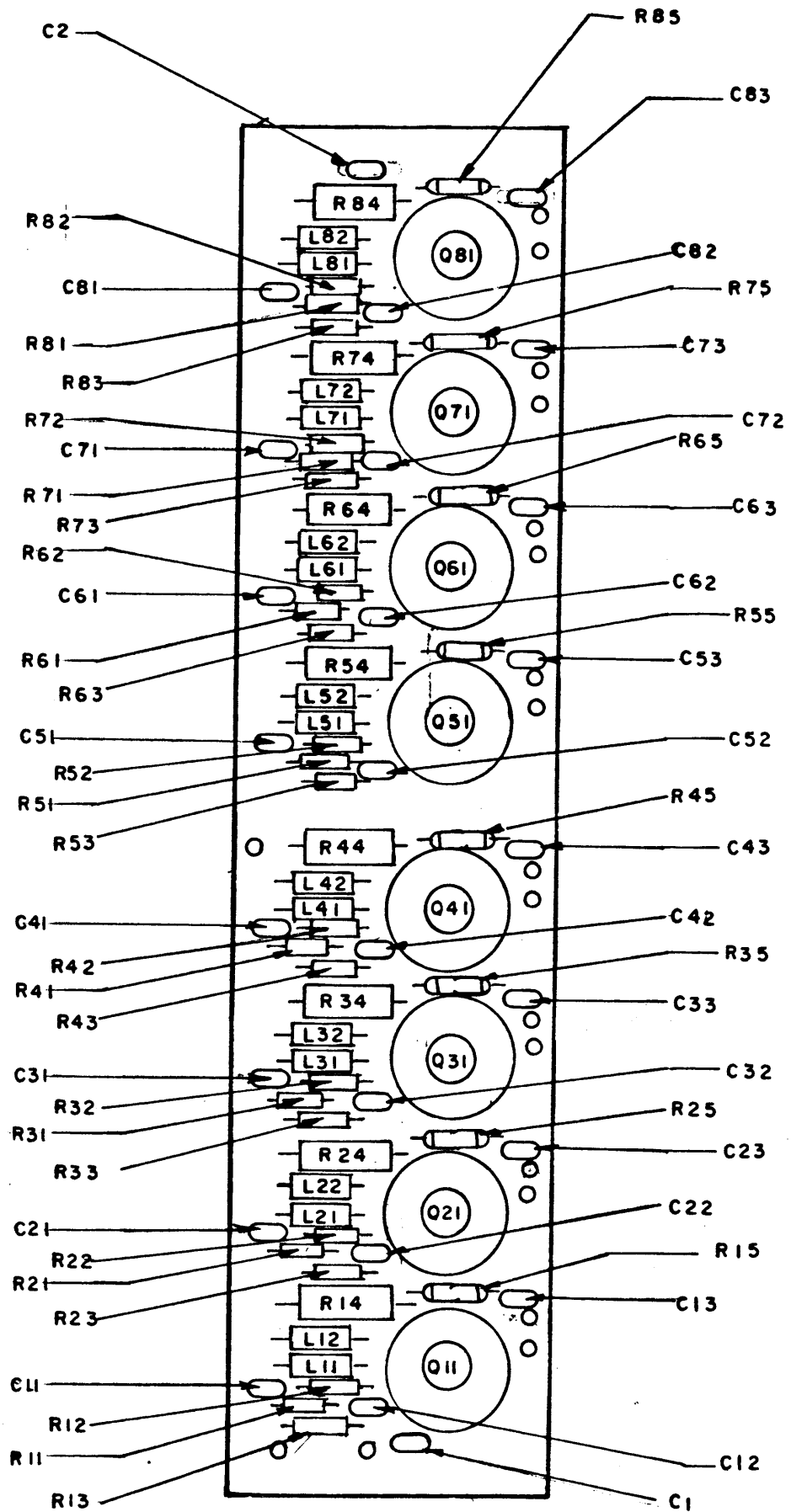
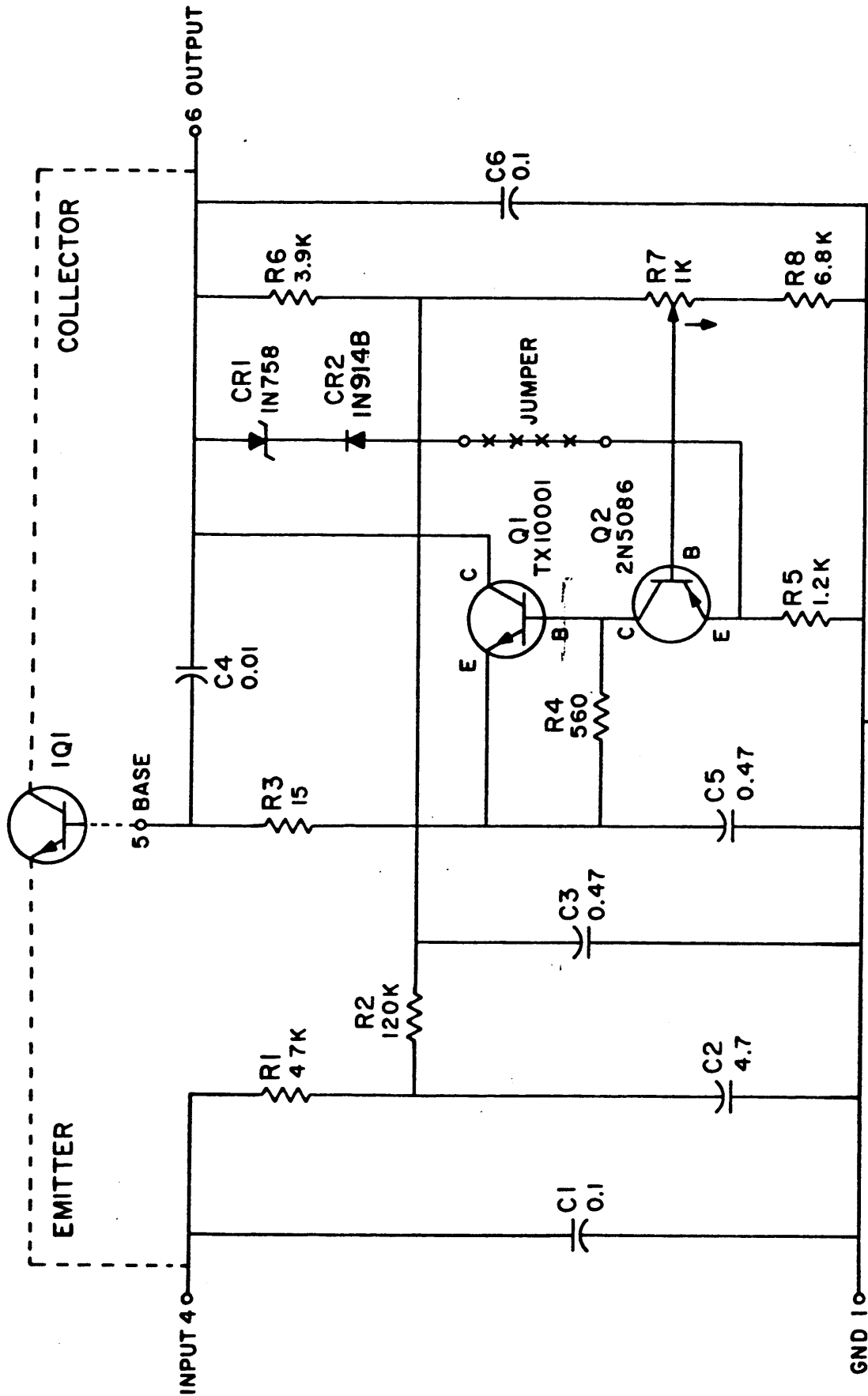


Figure 7.5 COMPONENT LOCATION, OUTPUT AMPLIFIER ASSEMBLY



NOTE
 ALL COMPONENTS PREFIXED
 BY FIGURES |A| IN PARTS LIST

UNLESS OTHERWISE SPECIFIED
 RESISTANCE IN OHMS 5%, 1/2W
 CAPACITANCE IN μF
 INDUCTANCE IN μh

Figure 7.6 SCHEMATIC DIAGRAM, REGULATOR ASSEMBLY (1A1)

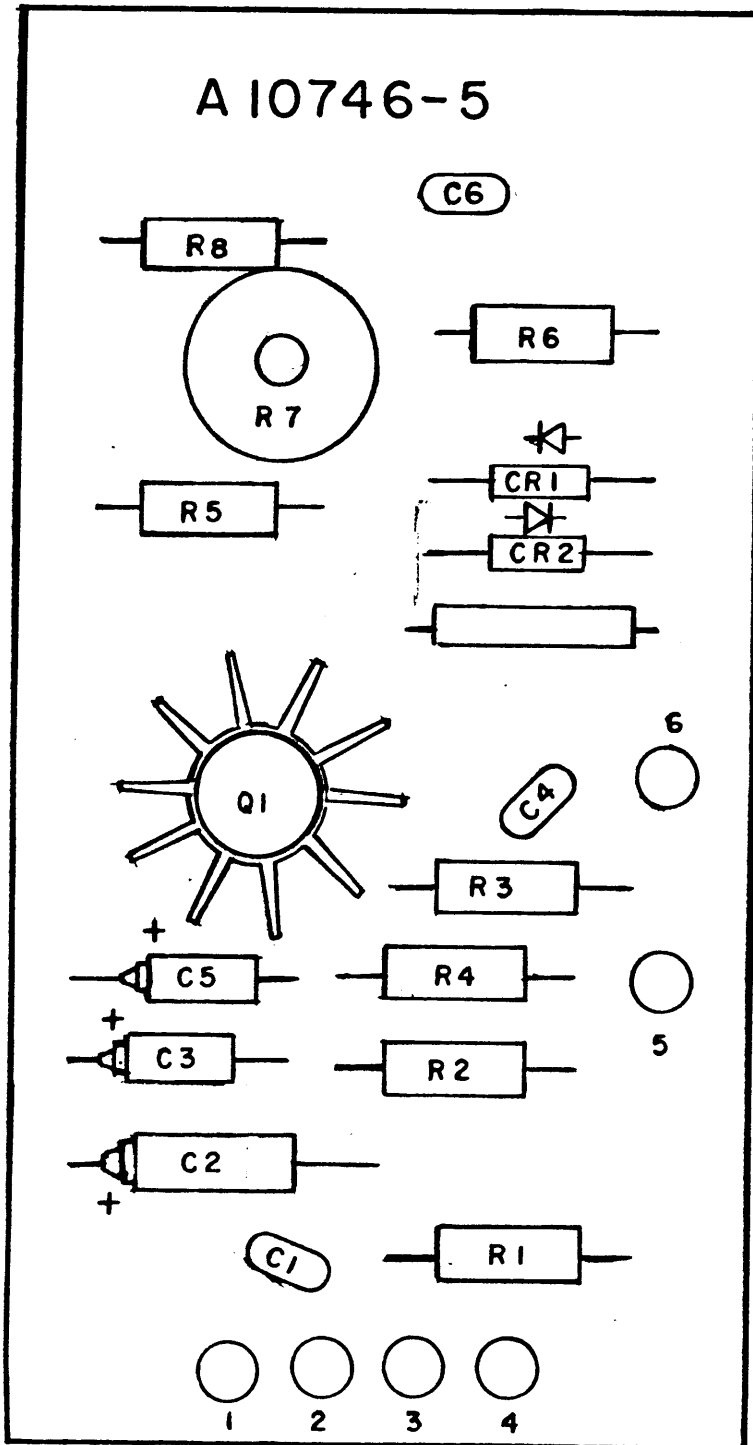
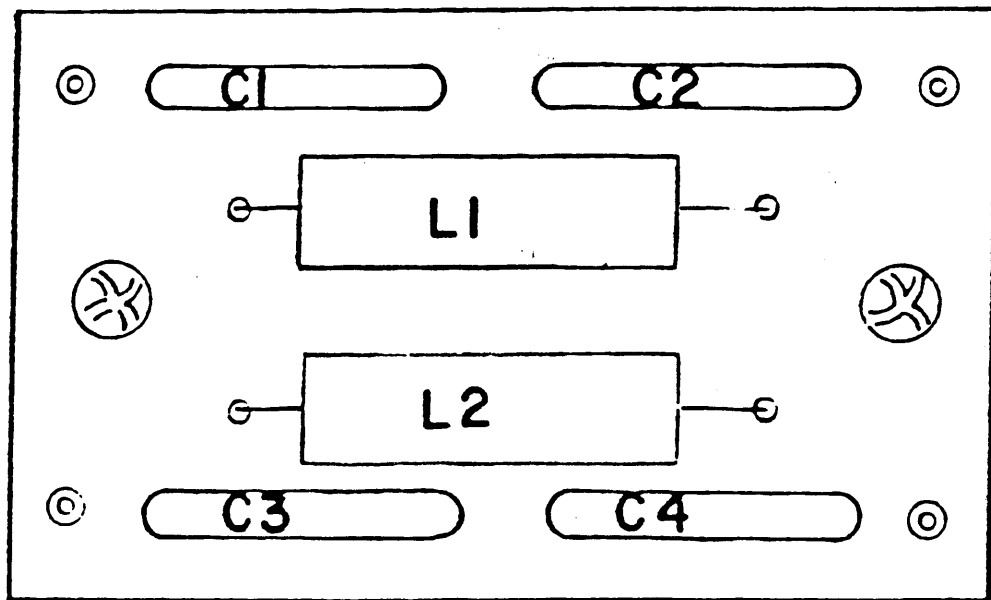
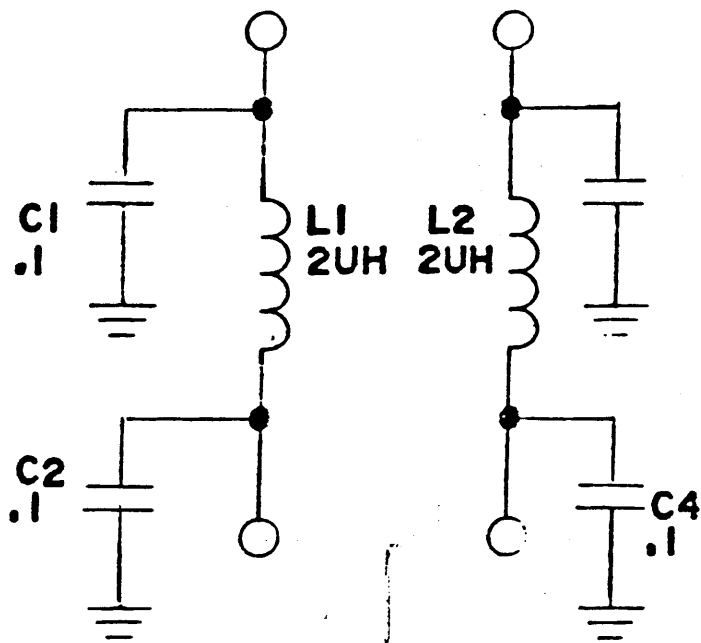
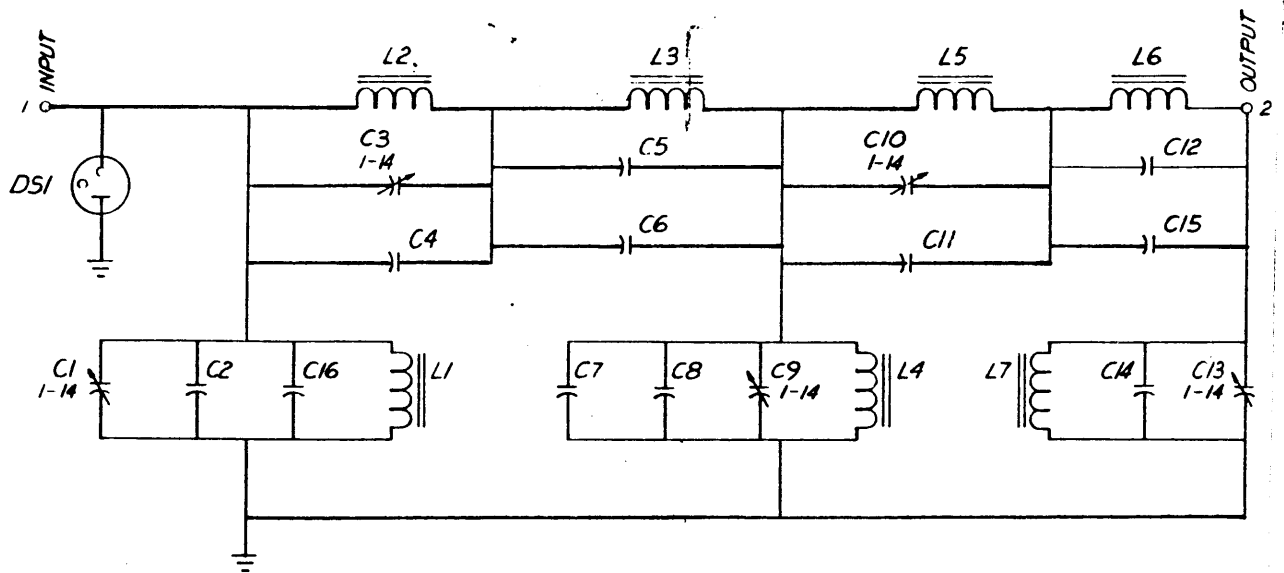


Figure 7.7 COMPONENT LOCATION, REGULATOR ASSEMBLY



A5780
(FL1)

Figure 7.8 SCHEMATIC DIAGRAM, LINE FILTER ASSEMBLY



C16	DSI	L7	
LAST COMP USED		MISSING COMP	

FX10018-1	75 Ω	5.61	.448	29.2	3.58	.306	9.52	7.5	56	5	820	56	91	5	27	1300	43		
FX10034	50 Ω	3.74	.299	19.45	2.39	.204	6.35	5	82	12	1300	12	100	47	43	1200	68	750	5
TYPE	IMPEDENCE	L1	L2	L3	L4	L5	L6	L7	C2	C4	C5	C6	C7	C8	C11	C12	C14	C15	C16

Figure 7.9 SCHEMATIC DIAGRAM, BAND PASS FILTER ASSEMBLY (FX100034)

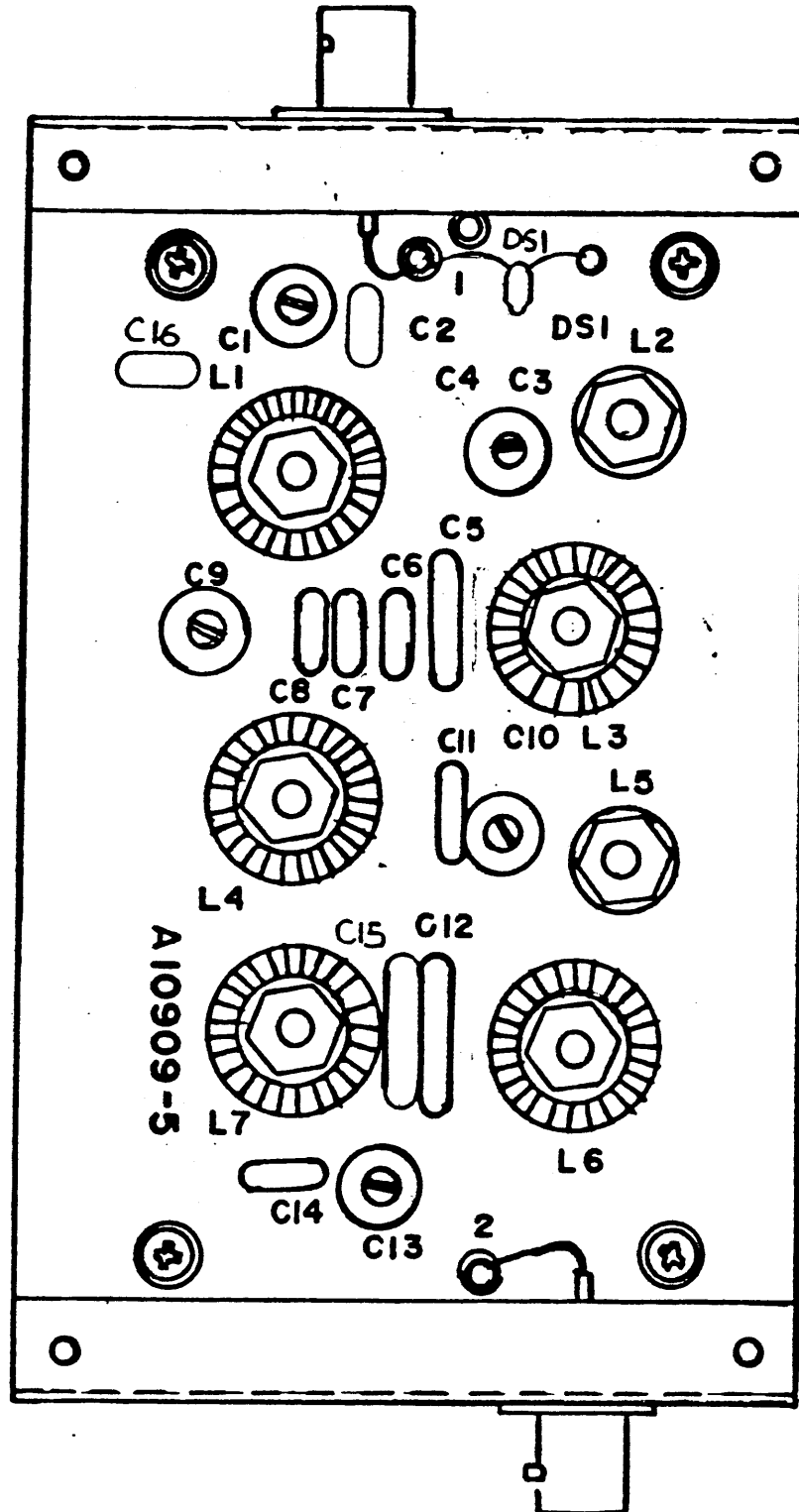
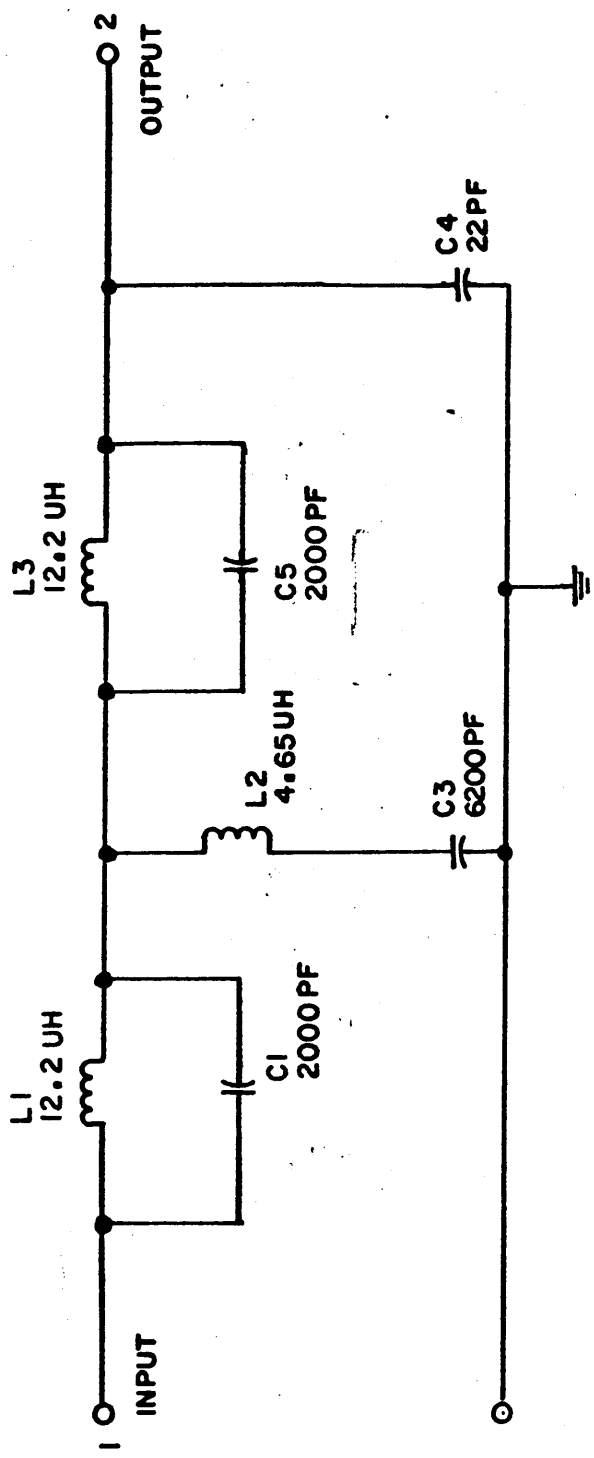


Figure 7.10 COMPONENT LOCATION, BAND PASS FILTER ASSEMBLY



Figur 7.11 SCHEMATIC DIAGRAM, BROADCAST STOPBAND FILTER ASSEMBLY

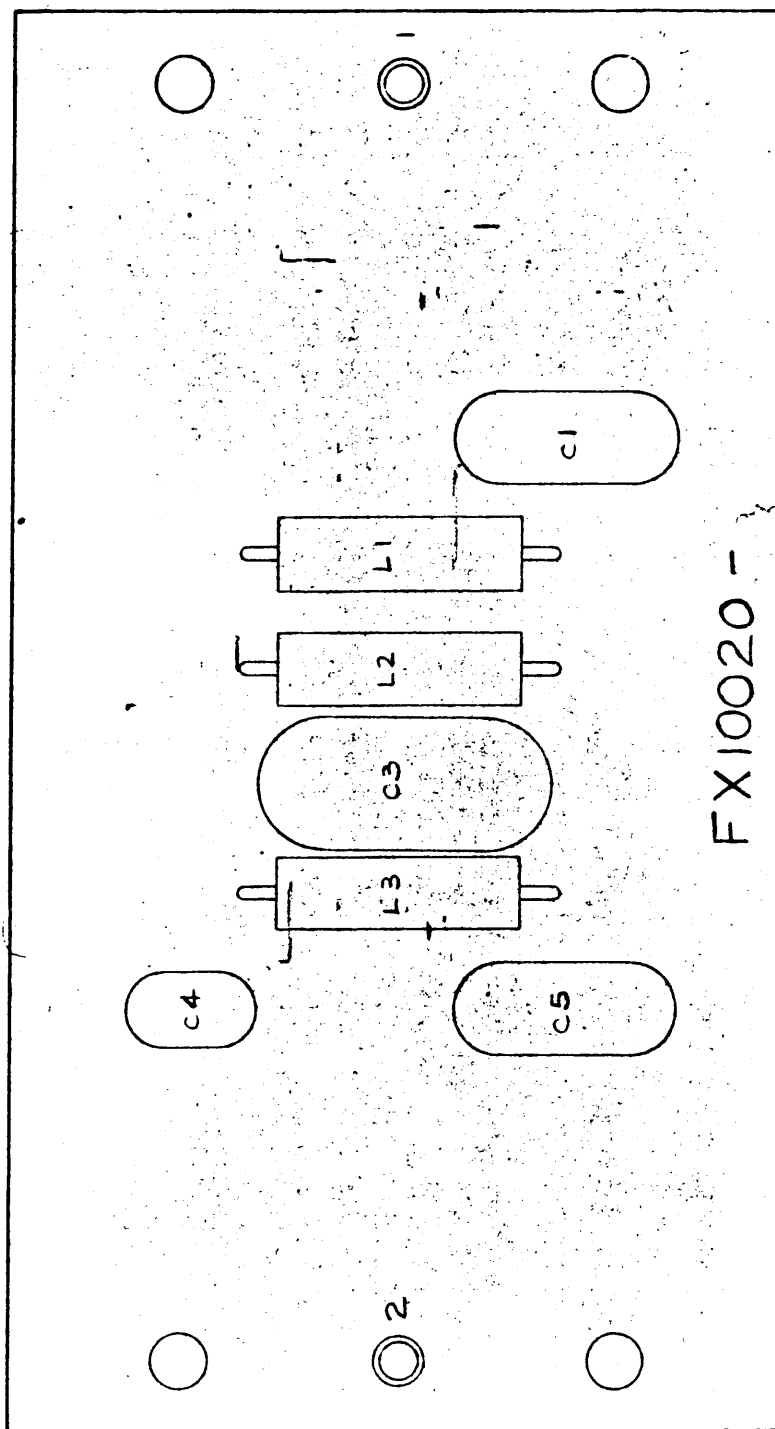


Figure 7.12 COMPONENT LOCATION, BROADCAST STOPBAND FILTER ASSEMBLY

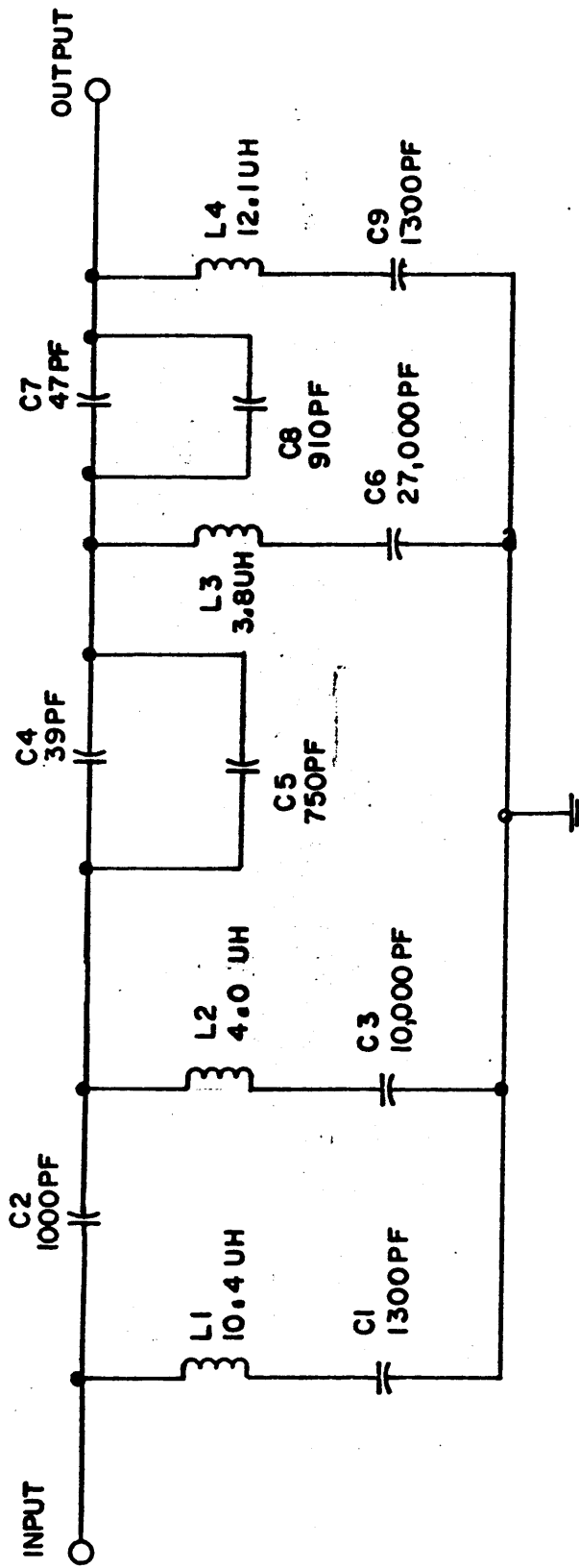


Figure 7.13 SCHEMATIC DIAGRAM, HIGH PASS FILTER ASSEMBLY (FX100021)

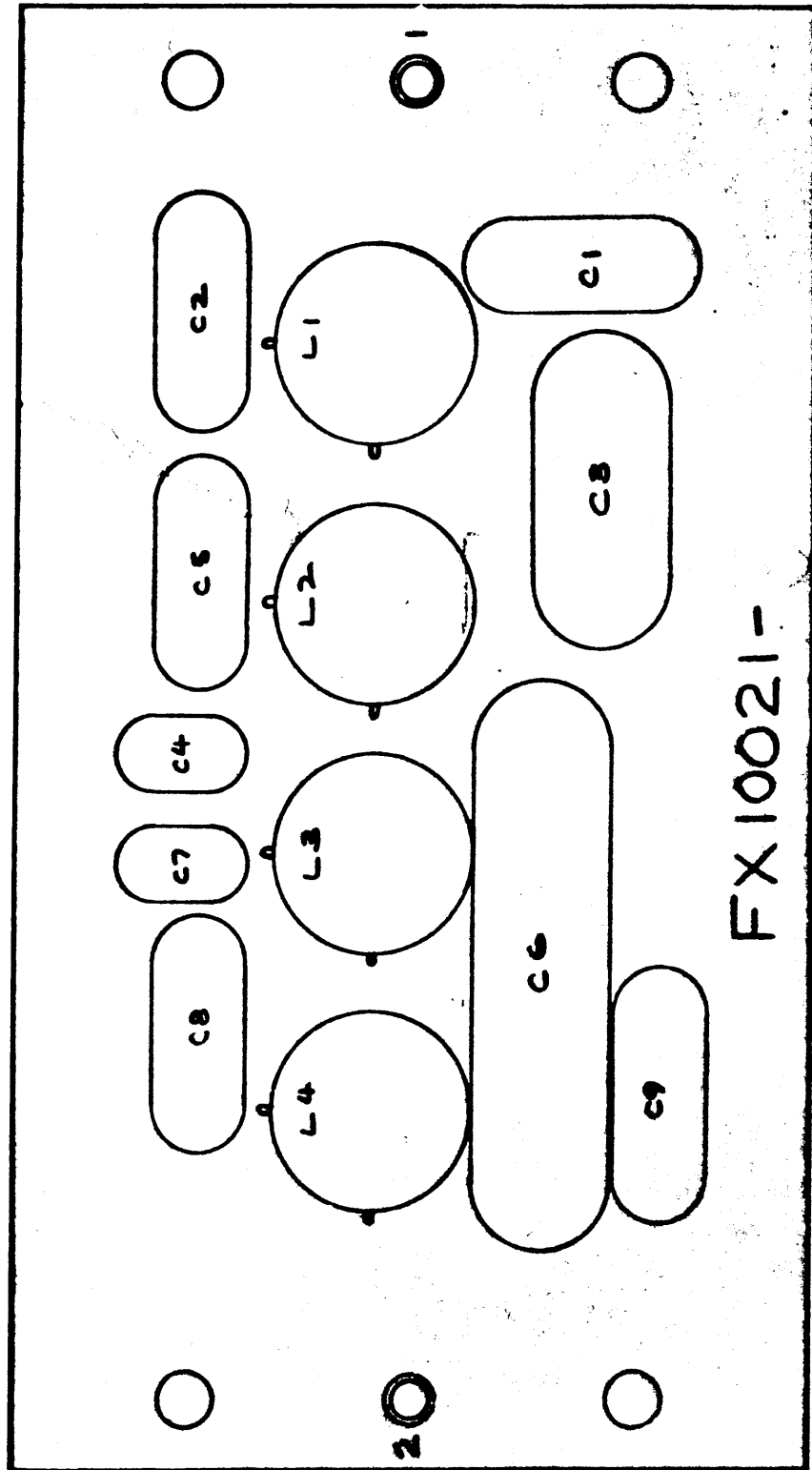


Figure 7.14 COMPONENT LOCATION, HIGH PASS FILTER ASSEMBLY

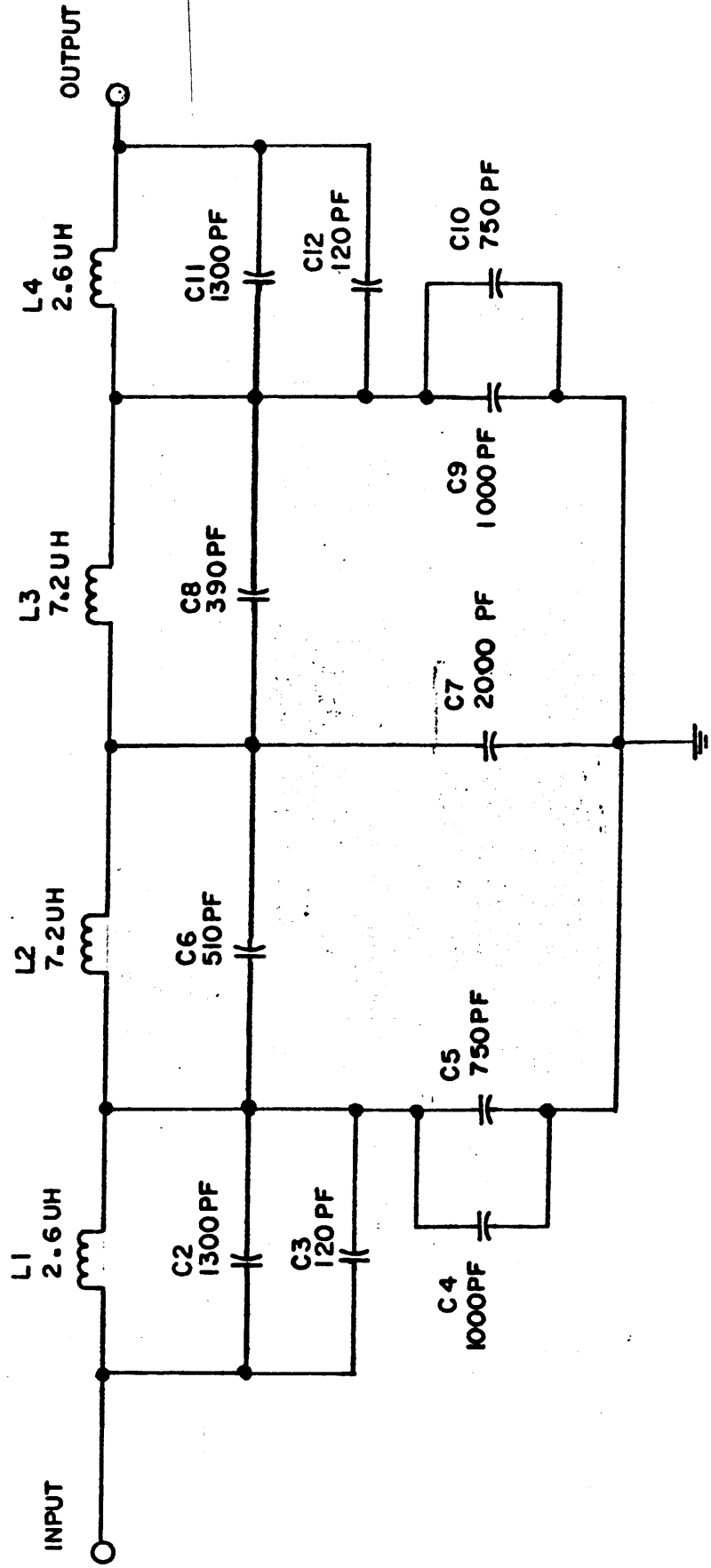


Figure 7.15 SCHEMATIC DIGRAM, LOW PASS FILTER ASSEMBLY (FX100022)

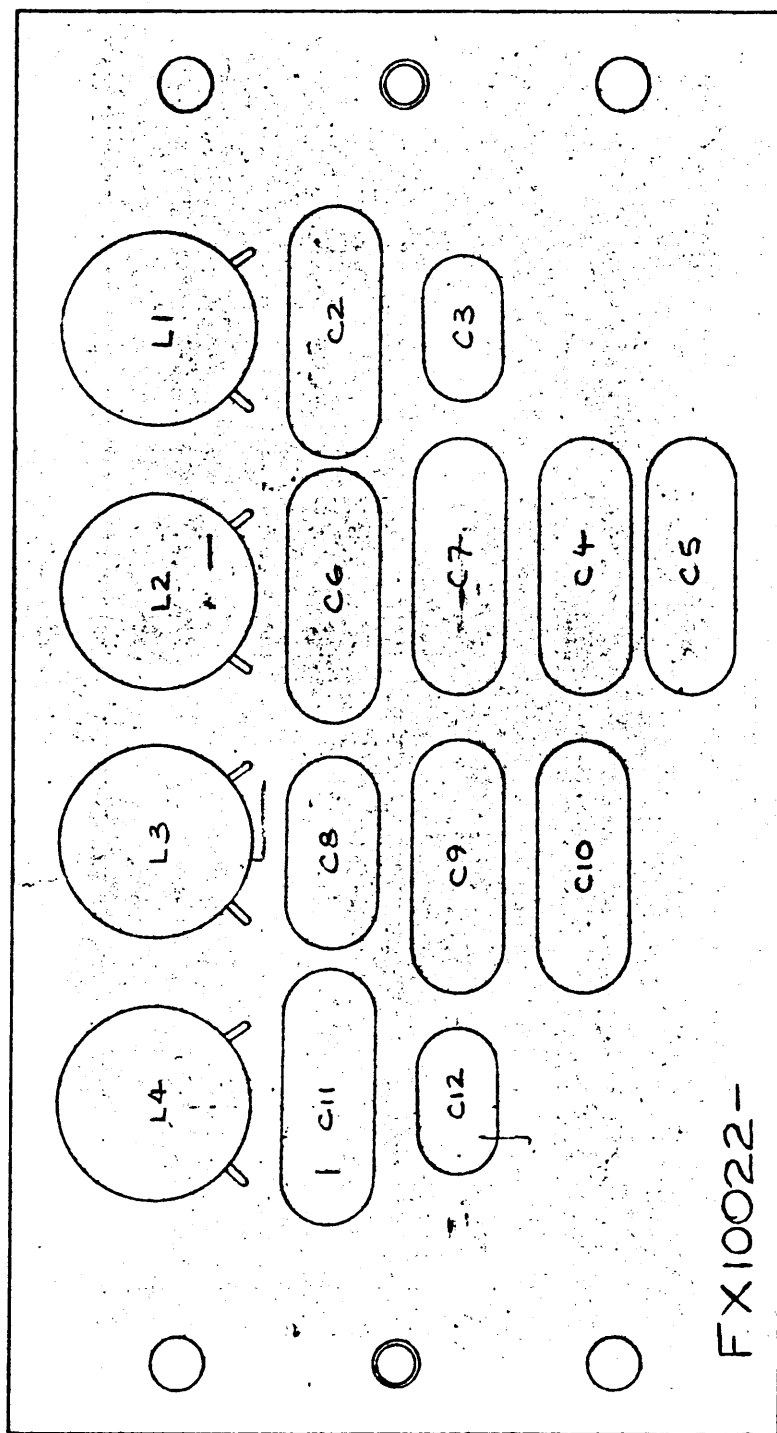


Figure 7.16 COMPONENT LOCATION, LOW PASS FILTER ASSEMBLY

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.

Government and PTT Organizations

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

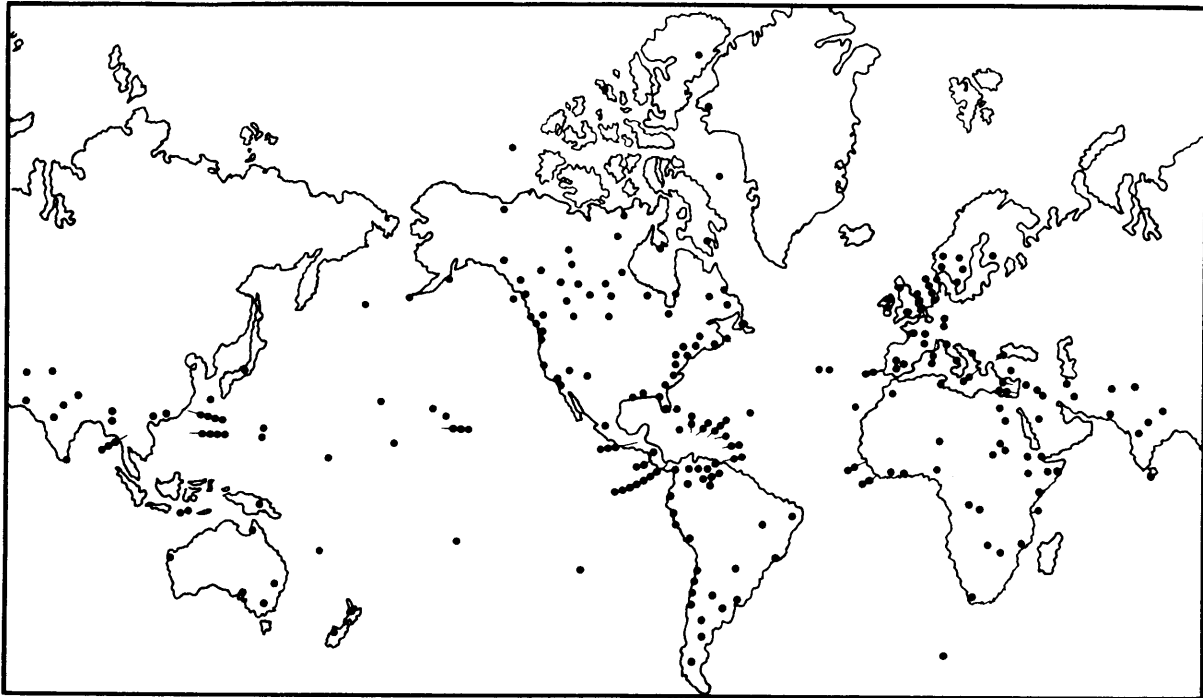
ANTENNA PRODUCTS

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 Connectors	CA	AX	TCA	RF Cables and Connector Assemblies
	PL	ES	SW	Plugs, Switches, End Seal Assemblies

"The World-Wide System of Remote Controlled Communications"



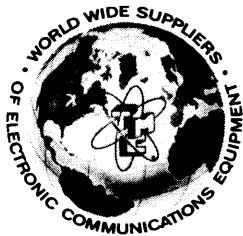
Locations of TMC Communication Installations Throughout The World

Mamaroneck, NEW YORK * Washington, DC * Dayton, OHIO * San Diego, CALIFORNIA
Ottawa, Ontario, CANADA
UNITED KINGDOM * NORWAY * FRANCE * WEST GERMANY * SWITZERLAND * ITALY
GREECE * PORTUGAL * SPAIN * ALGERIA * SAUDI ARABIA * TURKEY * CYPRUS
EGYPT * NIGERIA * ALGERIA * LIBERIA * KENYA * KUWAIT * TANZANIA * INDIA
PAKISTAN * BURMA * THAILAND * TAIWAN * KOREA * SRI LANKA * SINGAPORE
AUSTRALIA * NEW ZEALAND * MALAYSIA * NEPAL * BRAZIL * CHILE * PERU
ARGENTINA * ECUADOR * BOLIVIA * MEXICO * VENEZUELA * URUGUAY

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