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TECHNICAL MANUAL

FOR

EIGHT INPUT MULTIAN TENNA COUPLER
MODEL MAC-2

PUBLICATION NUMBER

ISSUE DATE

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THE TECHNICAL MATERIEL CORPORATION

CABLE: TEPEI

700 FENIMORE ROAD, MAMARONECK, NY 10543 U.S.A.

TLX: 137-358

TEL: 914-698-4800

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W a r r a n t y

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes, fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship 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 F.O.B. 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, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

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2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That 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.
4. That 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.

Electron tubes furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

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No warranties, express 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 Buyers 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 TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

*Electron tubes also include semi-conductor devices.

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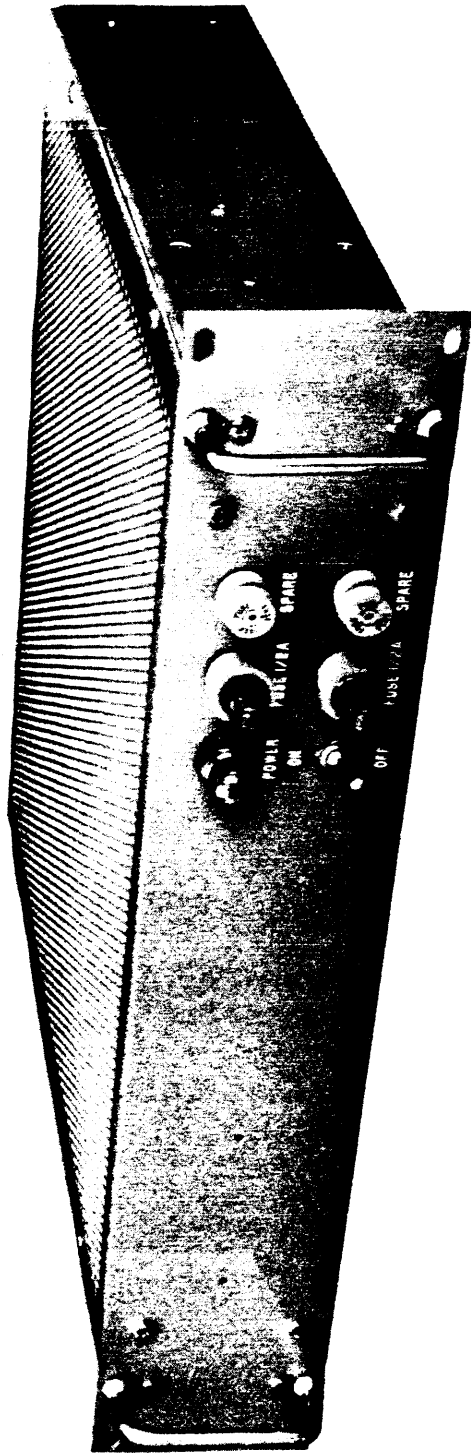


Figure 1-1 Eight Input Multiantenna Coupler Model MAC-2

SECTION 1

GENERAL DESCRIPTION

1-1 FUNCTIONAL DESCRIPTION

- (1) The Eight Input Multiantenna Coupler, Model MAC-2 (Figure 1-1) is a broadband coupling unit, used for coupling from one to eight antennas to a single receiver. The coupler will provide a nominal 2db gain from any antenna to the receiver, with a wide dynamic range and low noise characteristic over the frequency range from 250KHz to 32MHz. The equipment has been designed to provide excellent isolation from antenna to antenna and from the receiver to each antenna. The Multi-antenna Coupler is a solid state, transistor-type design.
- (2) The Multiantenna Coupler consists of eight input preamplifiers and a regulated power supply. The eight input preamplifiers are connected to the output amplifier through a signal combining transformer.
- (3) The input and output characteristic impedance is 50 ohms with a VSWR better than 1.5 to 1. From 2MHz to 32MHz and better than 2:1 from 250KHz to 2MHz. Phase correlation of input signals appearing at the output is kept within 2 degrees over the range 250KHz to 32MHz.

1-2 PHYSICAL DESCRIPTION

(1) The MAC-2 is designed for mounting in a standard 19-inch rack. The operating controls are located on the front panel. The eight input connectors, output connectors and power supply 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. Other components are mounted separately to the chassis.

(2) A list of semiconductors used in the MAC-2 are listed in Table 1-1.

Table 1-1 SEMICONDUCTOR AND INTEGRATED CIRCUIT COMPLEMENT

Reference Symbol	Type	Function
Power Supply		
Z1	NW10005	Rectifier Bridge
A1 CR1	1N758	Bias Regulator
A1 CR2	1N252	Bias Regulator
A1 Q1	TX10001	Current Regulator
A1 Q2	2N5086	Voltage Regulator
Q1	2N3055	Voltage Regulator
Preamplifiers (A2 to A9)		
A2 CR1	1N456A	Temp. Compensator
A2 CR2	1N456A	Temp. Compensator
A2 Q1	2N5160	Buffer
A2 Q2	2N5160	Current Amplifier
A2 Q3	2N3866	Current Amplifier
Output Buffer Amplifier (A10)		
A10 CR1	1N456A	Temp. Compensator
A10 CR2	1N456A	Temp. Compensator
A10 Q1	2N5160	Buffer
A10 Q2	2N5160	Current Amplifier
A10 Q3	2N3866	Current Amplifier

1-3 EQUIPMENT SUPPLIED

(1) The following table is a list of ancillary items supplied with each MAC-2.

Table 1-2 LOOSE ITEMS SUPPLIED, MAC-2

Name	Designation	Function	Qty
Power Cable Assembly	CA10625	Connections to power connector J10	1
Technical Manual		Instructions for operating and maintenance of MAC-2	1

1-4 TECHNICAL SPECIFICATIONS

Number of Inputs: Eight

Frequency Range: 250 KHz to 32 MHz

Inputs and output impedance: 50 ohms with a VSWR better than 1.5:1 from 2-32MHz 2:1 from 250 KHz to 2 MHz

Insertion gain: 2 db \pm 0.5

Desensitization: 100 uV signal is compressed by 3dB maximum when a 7 V peak-to-peak signal between 2 to 6 MHz is applied at the same time.

Noise figure: 7 dB maximum.

Intermodulation: With two 0.5 volts rms input signals, into 50 ohms
2nd order products,
-65 dB 2 to 32 MHz.
3rd order products,
-65 dB 2 to 32 MHz.

Isolation: -40 dB minimum, input to input.
-55 dB minimum, output to input.

Phase correlation between inputs: \pm 2 degrees between any two inputs.

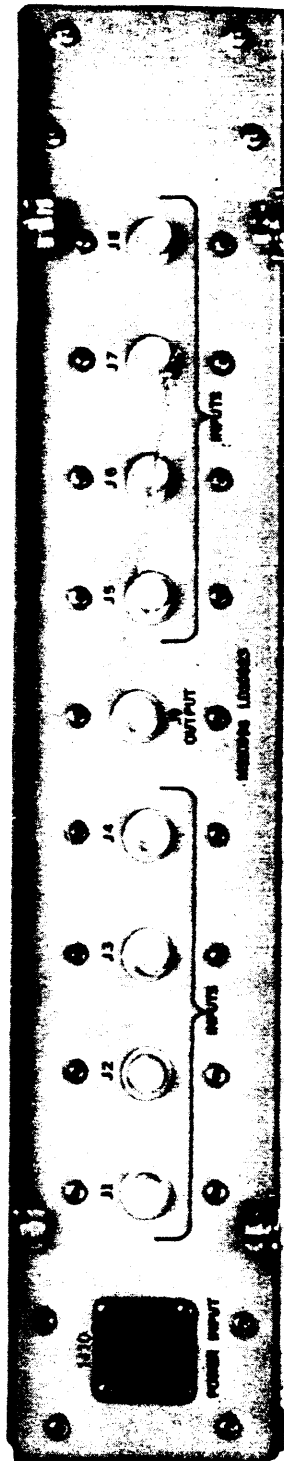


Figure 2-1 Rear Panel, MAC-2

SECTION 2
INSTALLATION

2-1 INITIAL INSPECTION

(1) Each MAC-2 coupler is thoroughly tested and adjusted at the factory before being shipped. Upon receipt of the unit, check the packing case and its contents for possible damage. Unpack the equipment carefully taking care also to check the packing material for parts shipped as loose items. (See Table 1-2). With respect to damaged equipment for which the carrier is liable, TMC will assist in describing methods of repair as well as furnishing of replacement parts.

2-2 POWER REQUIREMENTS & ELECTRICAL INSTALLATION

(1) The MAC-2 operates from a 115 volt ac, 50 to 60 Hz power source. The input is protected by two 0.5 amp fuses, one on each side of the line.

(2) The following external connections must be made to the MAC-2:

(a) Antennas: The antenna cables, fitted with BNC connectors, are connected to the ANTENNA INPUT jacks J1 to J8 on the rear panel of the MAC-2.

(b) Power: Connect primary power to the unit by plugging the supplied power cable assembly into connector J10 (POWER INPUT) on the rear panel, ensuring that the notch on the cable lines up with the pin at the top of J10.

(c) OUTPUT: Connect the output to the associated receiver via the BNC connector, J9 on the rear panel.

(3) All MAC-2 equipment should be located in such a way that sufficient clearance is obtained at the rear of the unit for making connections to the BNC connectors. The front panel controls should be within easy reach of an operator. The solid state design of the MAC-2 eliminates heat problems, allowing the installation of several coupler units one above the other in a rack.

2-3 PERFORMANCE CHECK

(1) When the MAC-2 has been installed and appropriate power connections have been made, turn POWER switch to the ON position. The POWER lamp will light, indicating that the MAC-2 coupler is ready for use.

SECTION 3
OPERATION,

3-1 GENERAL

(1) Controls: Table 3-1 contains a list of the operating, indicators and fuse holders on the front panel of the MAC-2.

(2) Procedures: After connecting antennas, receiver and power supply, and turning on the POWER switch, no operating procedures are required for the MAC-2. The unit is now fully operational without further adjustment.

Table 3-1 CONTROLS AND INDICATORS, MAC-2

Item	Description
Power ON/OFF switch S1	Controls primary power to MAC-2.
POWER lamp DS1	Lights when primary power is connected to the MAC-2 and switch S1 is turned on.
Fuse holders for F1 and F2	Failure of a fuse is indicated by illumination of the fuseholder
SPARE fuses	Two spare fuses are contained in the spare fuseholders which are located on the front panel.

SECTION 4

PRINCIPLES OF OPERATION

4-1 GENERAL

- (1) The Eight Input Multiantenna Coupler is a broadband antenna combining system, designed to couple from one to eight antennas to a single high-frequency communications receiver. The multi-coupler thereby permits the use of a receiver with a number of antennas for such purposes as space diversity, frequency diversity, polarization diversity of one of the several forms of steerable antennas.
- (2) Both the input and output impedance of the MAC-2 coupler are nominally 50 ohms, with a voltage standing-wave ratio characteristic better than 1.5 to 1 over the frequency range of 2 MHz to 32 MHz. 2:1 from 250KHz to 2MHz.
- (3) The MAC-2 coupler provides a nominal insertion gain of 2 decibels from each antenna input to the connected receiver. The coupler is designed to ensure a minimum of noise generation, and to provide a high degree of intermodulation rejection and isolation between input antennas. The rejection and isolation figures are stated in Paragraph 1-4 for this equipment.
- (4) The MAC-2 multicoupler consists of four major sections, as shown in Figure 4-1, System Block Diagram, MAC-2, and as described in the following paragraphs. These sections consist of the eight preamplifier printed wiring board assemblies, (A2 to A9), the output buffer amplifier assembly (A10), the power combiner (T2) and the regulated power supply.

4-2 PREAMPLIFIERS

(1) The eight preamplifier printed circuit boards, A2 to A9, are identical, wideband, negative feedback amplifier circuits. Each antenna input is resistance-capacity coupled to the preamplifier, with an input impedance of 50 ohms. The input signals are applied to the voltage amplifier Q1, followed by a complementary symmetrical push-pull amplifier circuit consisting of Q2 and Q3. Diodes CR1 and CR2 in the biasing circuit have been selected to provide temperature compensation for stabilized operation of the push-pull amplifier stage. Feedback is provided by R6 and C6, providing attenuation of the intermodulation products and improved gain stability in the preamplifier circuit. The preamplifier output is obtained through the dc blocking capacitor C12, and the rf signals are fed through coaxial cables to the power combining transformer T2.

4-3 OUTPUT BUFFER AMPLIFIER

(1) The power combining transformer output is connected with a coaxial cable to the output amplifier, A3. This amplifier is similar to the preamplifiers, with the exception of the input resistor, R1, the feedback circuit R6, C10, C6, and modification to the output to provide 50 ohms nominal impedance to the receiver through C13 and R12. The overall insertion gain from the antenna input to the coupler output is $2\text{db} \pm 0.5$ over the 250KHz to 32 MHz frequency range.

4-4 POWER SUPPLY AND REGULATOR

(1) The components comprising the power supply are all chassis mounted except for the regulator circuit which is mounted on printed circuit assembly A1. The latter is described in 4-4, paragraphs (3) and (4).

(2) Primary power is supplied through an ac line RF filter A5780 (A11) to the ON/OFF switch S1. When S1 is in the ON position, power is supplied through the two fuses F1 and F2 to the power transformer T1, and also to the front panel indicator lamp DS1. The secondary of transformer T1 produces -27 vac which is rectified by bridge rectifier Z1, and filtered by capacitor C1.

(3) The regulator board and transistor Q1 provide the voltage and current regulation required for the -27v supply. All components in this section, with the exception of transistor Q1, are mounted on printed circuit assembly A1. Potentiometer A1 R7 is used to set up the initial -27v required by the MAC-2 (see 5-5, Adjustments).

(4) The transistor A1 Q2 and diode pair A1 CR1 and A1 CR2 form a voltage reference circuit (sensitive to temperature and load changes) which in turn control Darlington-connected transistors A1 Q1, Q1 (2N3055), providing the necessary voltage and current regulation for the power supply, including short-circuit protection.

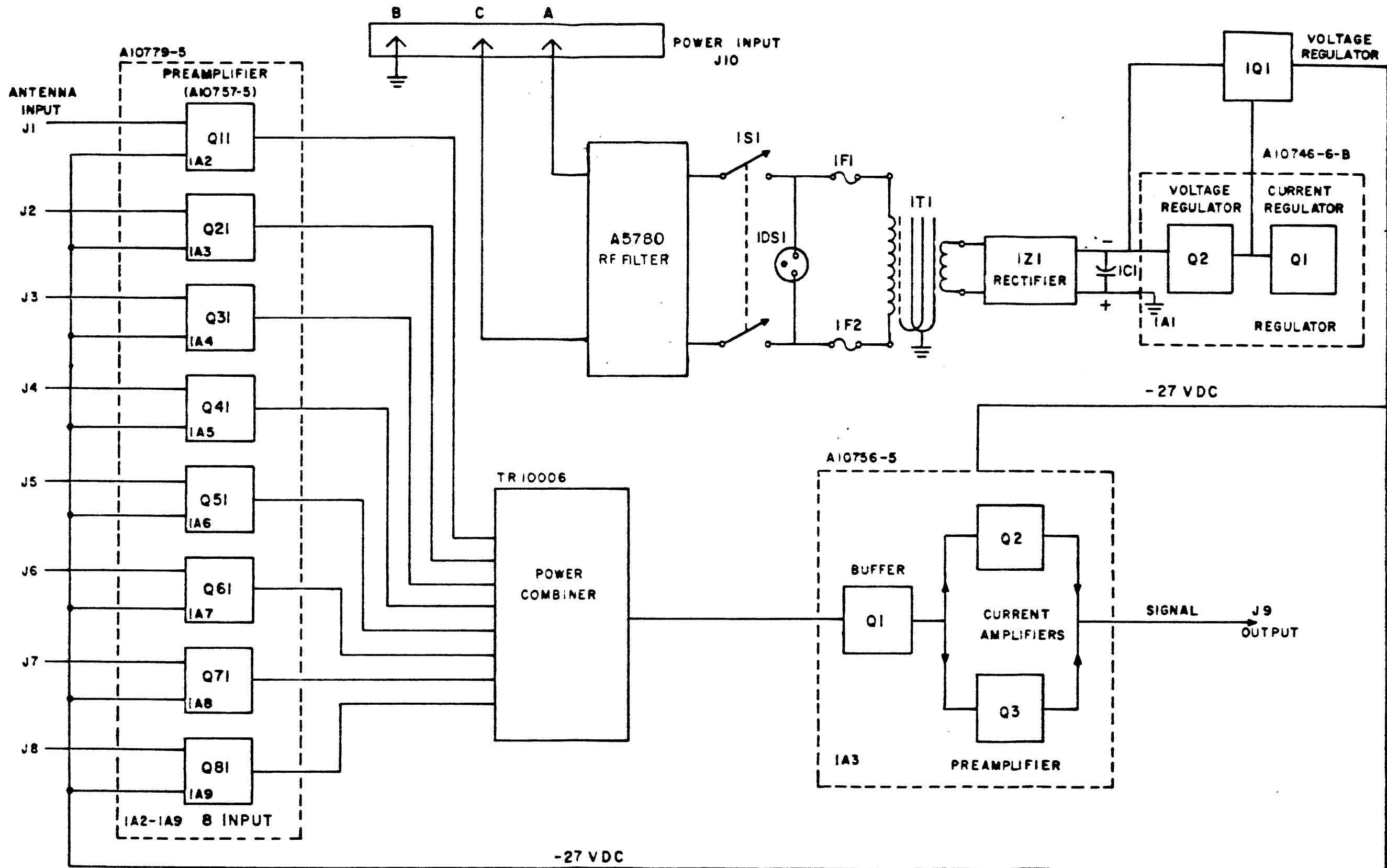


Figure 4-1 System Block Diagram, MAC-2

SECTION 5
MAINTENANCE

5-1 GENERAL

(1) This section describes the preventive maintenance, troubleshooting and repair procedures for the MAC-2. The following equipment is suggested in order to perform these procedures properly:

- (a) RF Signal Generator, Hewlett Packard Model 606A, or equivalent.
- (b) Oscilloscope, Tektronix Model 545 or equivalent.
- (c) Standard Volt-ohmmeter.

5-2 PREVENTIVE MAINTENANCE

(1) Preventive maintenance for the MAC-2 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 may possibly cause circuit failure. To facilitate cleaning the unit, use a vacuum cleaner or a low-pressure filtered compressed air supply.

(2) A simple visual check of the unit when it is opened up for servicing or cleaning will often reveal potential trouble and hence 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

(1) During operation of the MAC-2, the following failure symptoms may be observed:

1. No signal output from the receiver.
2. Weak or noisy signals at the receiver output.
3. Apparent failure of one or more of the diversity modes of reception.

(2) The primary objective of the trouble-shooting procedures is to localize the fault to a particular section of the coupler unit. Table 5-1 provides a guide to location and correction of the possible failures.

Table 5-1 TROUBLESHOOTING PROCEDURES

SYMPTOM	POSSIBLE CAUSE	REMEDIAL ACTION
1. No signal output from the receiver	(a) Receiver failure.	(a) Refer to receiver manual.
	(b) Interconnection, coupler to receiver.	(b) Check rf cable between the coupler and receiver.
	(c) Power supply failure in the coupler.	(c) If POWER ON lamp DS1 is not illuminated, check for power input failure or defective input filter A5780. If POWER ON lamp is on, check fuses F1, F2 and replace with spare if necessary. If both fuses are intact, proceed to check transformer T1, bridge rectifier Z1 and the voltage regulator A1. -27 vdc should be available at terminal 6 of the regulator board.

SYMPTOM	POSSIBLE CAUSE	REMEDIAL ACTION
2. Weak or noisy signals at the receiver output.	(d) Output buffer amplifier failure.	(d) 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 A10 will be necessary.
	(e) Power combiner failure.	(e) If the output buffer amplifier is found to be serviceable, failure of the interconnection cable to the power combiner T2, the power combiner unit, or a short circuit in a preamplifier connection to the power combiner should be investigated and corrected.
	(a) Receiver noise. (b) Interconnection, coupler to receiver. (c) Amplifier defect in the coupler.	(a) Refer to receiver manual. (b) Check the rf cable between coupler and receiver. (c) Using the rf signal generator and the oscilloscope, test for gain & noise generation between the input jack of each preamplifier and the output buffer amplifier receiver connection. If signal attenuation or noise appears on all inputs, check for defective components in the output amplifier, or a defect between the power combiner and the output amplifier. If attenuation or noise appears on only one input, check for a defect in the associated input

SYMPTOM	POSSIBLE CAUSE	REMEDIAL ACTION
3. Apparent failure of one or more input models.	(a) Preamplifier defect in the coupler. (b) Power combiner defect.	amplifier or interconnection to the power combiner. If no abnormal attenuation or noise generation is found in the receiver or coupler, check for antenna or antenna cable defects. (a) Using the rf signal generator and oscilloscope, test for a defective preamplifier in the associated antenna circuit. (b) If the preamplifier is found to be serviceable, test for continuity of the rf signal through the power combiner.

5-4 REPAIR

- (1) Repair work generally consists of the replacement of the defective component. The following cautions should be observed:
- (a) Ensure replacement of component with an exact duplicate. This is particularly important in the amplifier modules.
 - (b) Place any new component in the same location as the part it replaces. The dressing of wire runs should not be altered.
 - (c) Observe standard practice when replacing semiconductor components, using a low wattage soldering iron and heat sink tools.
 - (d) Avoid damage to the printed circuitry when handling or repairing amplifier and regulator modules.

5-5 ADJUSTMENTS

(1) Only one adjustment is required in the MAC-2 multiantenna coupler:

- (a) Power Supply Regulator A1: a screwdriver - adjustable potentiometer, R7, has been factory-set to provide -27 vdc. If the output voltage is found to require adjustment, use an accurate voltmeter and set to -27 vdc by clockwise (lowering) or anticlockwise (raising) rotation of the potentiometer control.

(2) The amplifiers do not require any adjustment, as all components are of fixed values.

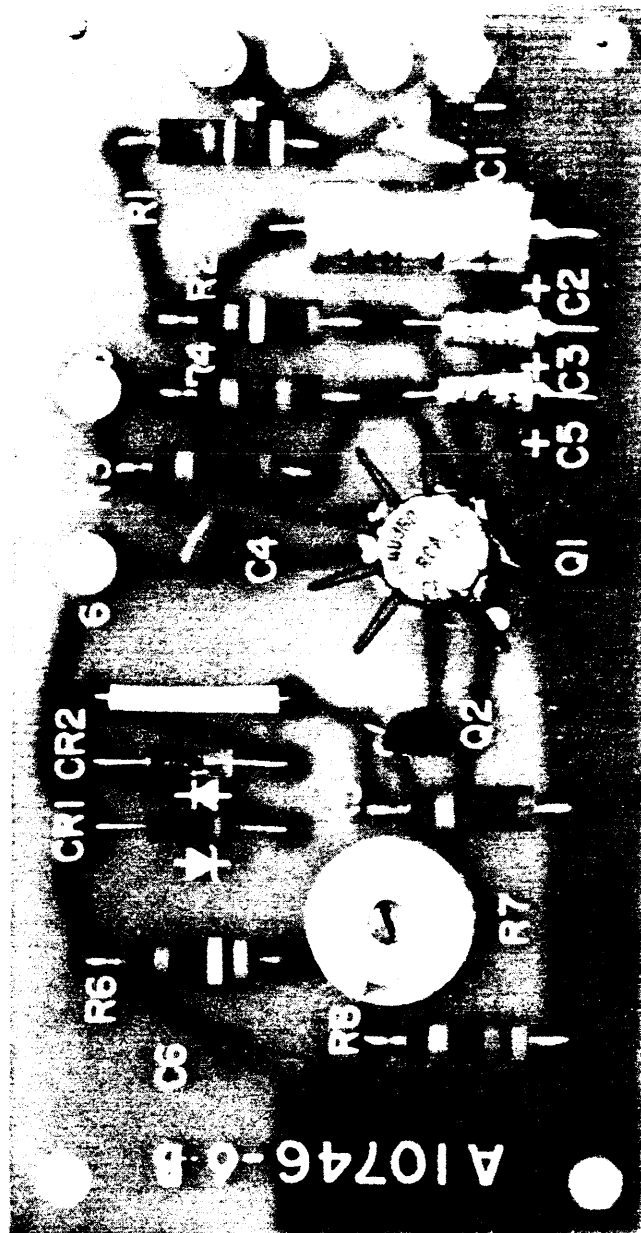


Figure 5-2 Power Supply (Regulator) Assembly 1A1

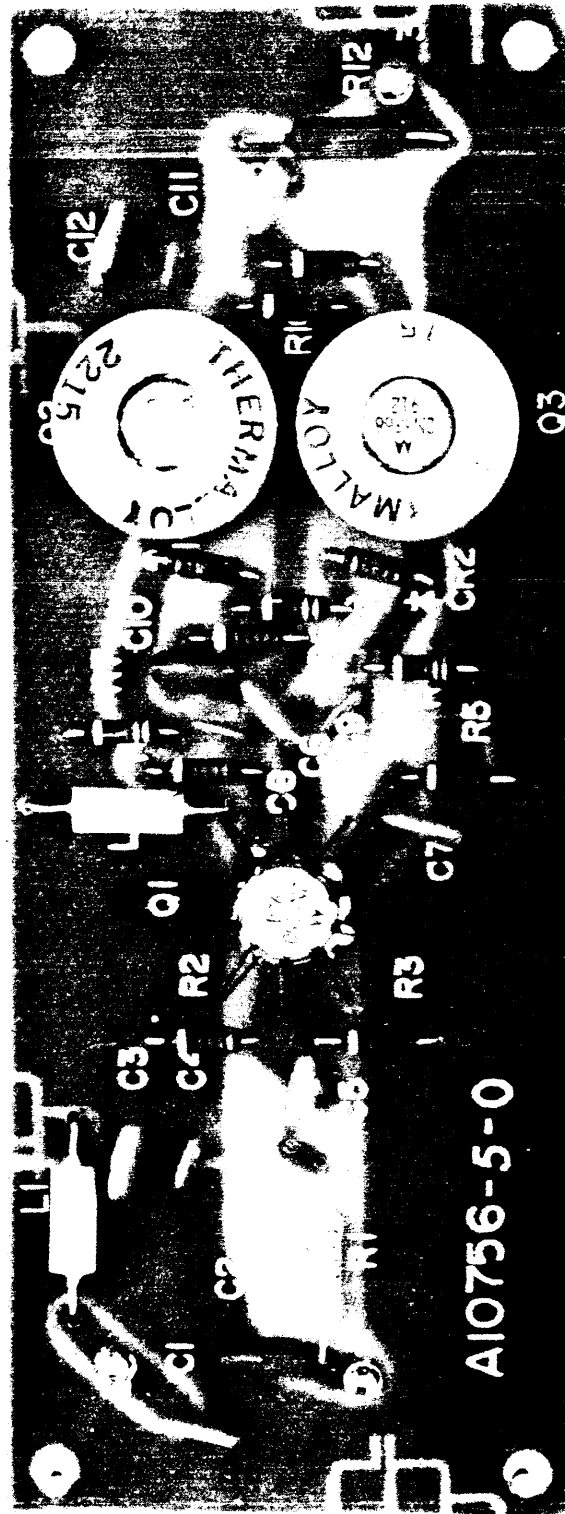


Figure 5-4 Output Amplifier Assembly 1A10

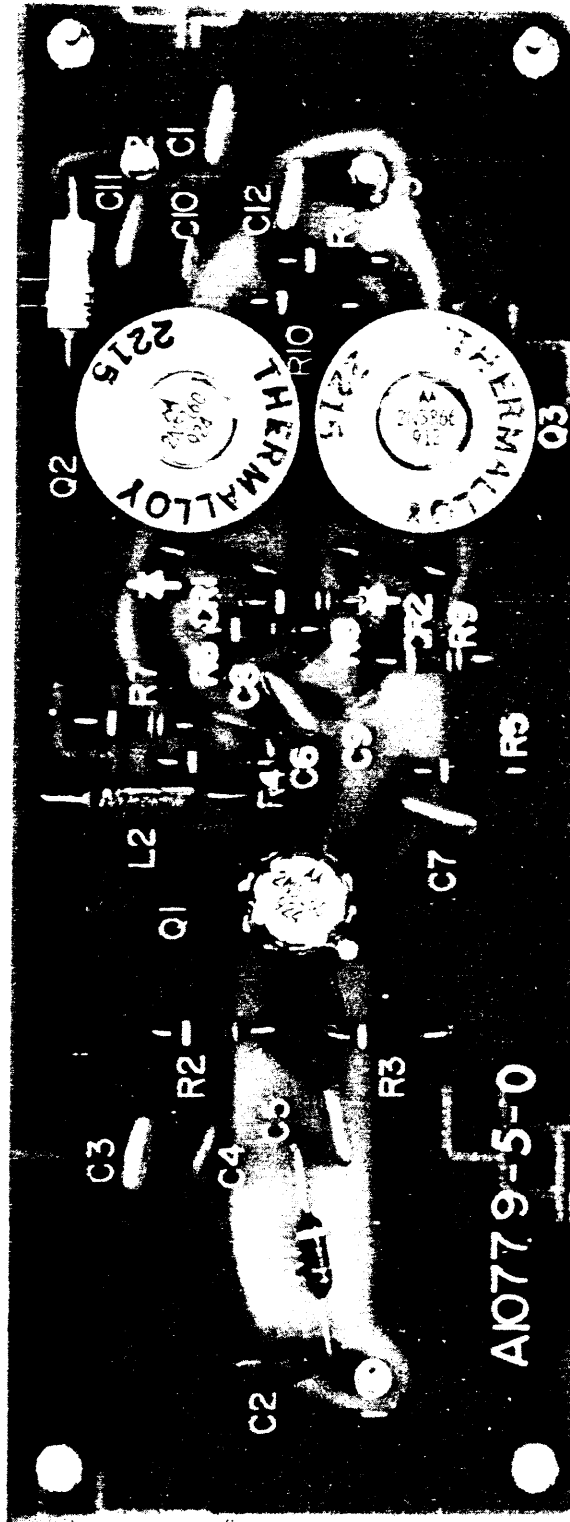


Figure 5-3 Input Preamplifier Assemblies IA2 through IA9

SECTION 6
PARTS LIST

6-1 INTRODUCTION

- (1) Reference symbols have been assigned to identify all electrical parts. These symbols are marked on the equipment adjacent to the parts that they identify and are included on all drawings, diagrams and part lists. The letters of a reference symbol indicate the generic group of the part, such as capacitor, resistor, transistor etc. The numeral identifies parts of the same generic group. Sockets associated with any particular plug-in device, such as a transistor or fuse, are identified by a reference symbol used for that device as well as a prefix symbol.
- (2) Prefix symbols have also been assigned to each separate printed circuit board assembly (A1, A2 etc).
- (3) To expedite delivery when ordering replacement parts specify the TMC part number and the name and model number of the equipment.

6-2 NOTE

- (1) Re RF Cable Assemblies CA10552-3 and CA10552-4.
 - (a) The RF cable assemblies are coaxial cables having a male connector at each end.

MAIN CHASSIS, FRONT AND REAR PANELS

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A1	PRINTED CIRCUIT ASSEMBLY: Regulator	A10746-6
A2	PRINTED CIRCUIT ASSEMBLY: Preamplifiers	A10779-5
A3	SAME AS A2	
A4	SAME AS A2	
A5	SAME AS A2	
A6	SAME AS A2	
A7	SAME AS A2	
A8	SAME AS A2	
A9	SAME AS A2	
A10	PRINTED CIRCUIT ASSEMBLY: Output Buffer Amplifier	A10756-5
CA	CABLE: RF, coaxial with connectors	CA10552-4
CB	CABLE: RF, coaxial with connectors	CA10552-4
CC	CABLE: RF, coaxial with connectors	CA10552-4
CD	CABLE: RF, coaxial with connectors	CA10552-4
CE	CABLE: RF, coaxial with connectors	CA10552-4
CF	CABLE: RF, coaxial with connectors	CA10552-4
CG	CABLE: RF, coaxial with connectors	CA10552-4
CH	CABLE: RF, coaxial with connectors	CA10552-4
CJ	CABLE: RF, coaxial with connectors	CA10552-3
CI	CAPACITOR: Electrolytic, 2900 uf	CE112-5
DS1	LAMP: Neon	BI100-51
F1	FUSE: Slo-blo, 0.5 amp	FU102-.5
F2	SAME AS F1	
FL1	FILTER: RF, line	A5780
FL2	SAME AS FL1	

MAIN CHASSIS, FRONT AND REAR PANELS (Cont'd)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
J10	CONNECTOR: Receptacle, male	MS3102A-14S-7P
S1	SWITCH: Toggle	ST22K
T1	TRANSFORMER: Power	TF443
T2	POWER COMBINER	COB-1-8
Q1	TRANSISTOR: NPN	2N3055
Z1	NETWORK: Rectifier, diode bridge	NW10007
XDS1	HOLDER: Lamp	LH77/1LC19CN
XF1	HOLDER: Fuse	FHL17G1
XF2	SAME AS XF1	
XF1S	HOLDER: Spare fuse	FHN26G1
XF2S	SAME AS XF1S	
XQ1	SOCKET: Transistor	TS166-1

POWER SUPPLY (REGULATOR) ASSEMBLY A1

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A1C1	CAPACITOR: Fixed, ceramic, 0.1 uf	CC10015-X5V104M
A1C2	CAPACITOR: Fixed, tantalum, 6.8 uf	CSR13G685ML
A1C3	CAPACITOR: Fixed, tantalum, 0.47 uf	CSR13G474ML
A1C4	CAPACITOR: Fixed, ceramic, 0.01 uf	CC10017-X5V103M
A1C5	SAME AS A1C3	
A1C6	SAME AS A1C1	
A1CR1	DIODE: Zener	1N758A
A1CR2	DIODE:	1N252
A1R1	RESISTOR: Fixed, composition, 47K, 1/2 w, 5%	RC20GF473J
A1R2	RESISTOR: Fixed, composition, 68K, 1/2 w, 5%	RC20GF683J
A1R3	RESISTOR: Fixed, composition, 15 ohms, 1/2 w, 5%	RC20GF150J
A1R4	RESISTOR: Fixed, composition, 560 ohms, 1/2 w, 5%	RC20GF561J
A1R5	RESISTOR: Fixed, composition, 1.2K, 1/2 w, 5%	RC20GF122J
A1R6	RESISTOR: Fixed, composition, 3.9K, 1/2 w, 5%	RC20GF392J
A1R7	RESISTOR: variable, composition 1K, linear	RV111U102A
A1R8	RESISTOR: Fixed, composition, 6.8K, 1/2 w, 5%	RC20GF682J
A1Q1	TRANSISTOR: NPN, Silicon	TX10001
A1Q2	TRANSISTOR: PNP, Silicon	2N5086

PREAMPLIFIER ASSEMBLY A2 THROUGH A9

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
NOTE: The following components are common to all units A2 to A9 inclusive.		
A2C1	CAPACITOR: Fixed, ceramic 0.1 uf	CC10015-X5V-104M
A2C2	CAPACITOR: Fixed, mica 22 uuf, 2%	CM04ED220J03
A2C3	SAME AS A2C2	
A2C4	SAME AS A2C1	
A2C5	SAME AS A2C1	
A2C6	SAME AS A2C1	
A2C7	SAME AS A2C1	
A2C8	SAME AS A2C1	
A2C9	SAME AS A2C1	
A2C10	SAME AS A2C1	
A2C11	SAME AS A2C1	
A2C12	SAME AS A2C4	
A2C13	CAPACITOR: Fixed, mica 5 uuf	CM04CD050D03
A2CR1	DIODE:	1N456A
A2CR2	SAME AS A2CR1	
A2J1	CONNECTOR: BNC, receptacle	UG625B/U
A2J11	SAME AS A2J1	
A2R1	RESISTOR: Fixed, film 680 ohms, 1/4 w, 2%	RL07S680G
A2R2	RESISTOR: Fixed, film 8.2 K, 1/4 w, 2%	RL07S822G
A2R3	RESISTOR: Fixed, film 1K, 1/4 w, 2%	RL07S102G
A2R4	RESISTOR: Fixed, film 620 ohms, 1/4 w, 2%	RL07S621G

PREAMPLIFIER ASSEMBLY A2 THROUGH A9 (Cont'd)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A2R5	RESISTOR: Fixed, film 100 ohms, 1/4 w, 2%	RL07S101G
A2R6	RESISTOR: Fixed, film 180 ohms, 1/4 w, 2%	RL07S181G
A2R7	RESISTOR: Fixed, film 3.3K, 1/4 w, 2%	RL07S332G
A2R8	RESISTOR: Fixed, film 330 ohms, 1/4 w, 2%	RL07S331G
A2R9	SAME AS A2R7	
A2R10	RESISTOR: Fixed, film 100 ohms, 1/4 w, 2%	RL07S100G
A2R11	SAME AS A2R10	
A2L1	INDUCTOR: RF coil, 33 uh	CL275-330
A2L2	INDUCTOR: RF coil, 3.3 uh	CL275-3R3
A2Q1	TRANSISTOR: PNP	2N5160
A2Q2	SAME AS A2Q1	
A2Q3	TRANSISTOR: NPN	2N3866

NOTE

Input Amplifiers A3 through A9 are identical to assembly A2 with the exception of the BNC connectors Part # UG625B/U which are designated A3J2, A3J12, A4J3, A4J13, etc.

OUTPUT BUFFER AMPLIFIER ASSEMBLY A10

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A10C1	CAPACITOR: Fixed, ceramic 0.1 uf	CC10015-X5V104M
A10C2	CAPACITOR: Fixed, mica 22 uuf	CM04ED220J03
A10C3	SAME AS A10C1	
A10C4	SAME AS A10C1	
A10C5	SAME AS A10C1	
A10C6	SAME AS A10C1	
A10C7	SAME AS A10C1	
A10C8	CAPACITOR: Fixed, ceramic .01 uf	CC10017-X5V-103M
A10C9	SAME AS A10C3	
A10C10	CAPACITOR: Fixed, mica 5 uuf	CM04CD050D03
A10C11	SAME AS A10C8	
A10C12	SAME AS A10C1	
A10J9	CONNECTOR: BNC, receptacle	UG625B/U
A10J19	SAME AS A10J9	
A10L1	INDUCTOR: RF coil, 33 MH	CL275-330
A10L2	INDUCTOR: RF coil, 3.3 MH	CL275-3R3
A10R1	RESISTOR: Fixed, film 59 ohms, 1/4 w, 1%	RN60D59ROF
A10R2	RESISTOR: Fixed, film 8.2K, 1/4 w, 2%	RL07S822G
A10R3	RESISTOR: Fixed, film 1K, 1/4 w, 2%	RL07S102G
A10R4	RESISTOR: Fixed, film 620 ohms, 1/4 w, 2%	RL07S621G
A10R5	RESISTOR: Fixed, film 100 ohms, 1/4 w, 2%	RL07S101G
A10R6	RESISTOR: Fixed, film 150 ohms, 1/4 w, 2%	RL07S151G

OUTPUT BUFFER AMPLIFIER ASSEMBLY A10 (Cont'd)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
A10R7	RESISTOR: Fixed, film 3.3K, 1/4 w, 2%	RL07S332G
A10R8	RESISTOR: Fixed, film 300 ohms, 1/4 w, 2%	RL07S301G
A10R9	SAME AS A10R7	
A10R10	RESISTOR: Fixed, film 10 ohms, 1/4 w, 2%	RL07S100G
A10R11	SAME AS A10R10	
A10R12	RESISTOR: Fixed, film 59.0 ohms, 1/4 w, 1%	RN60D59ROF
A10Q1	TRANSISTOR: PNP	2N5160
A10Q2	SAME AS A10Q1	
A10Q3	TRANSISTOR: NPN	2N3866
A10CR1	DIODE:	1N456A
A10CR2	SAME AS A10CR1	

SECTION 7

SCHEMATIC DIAGRAM

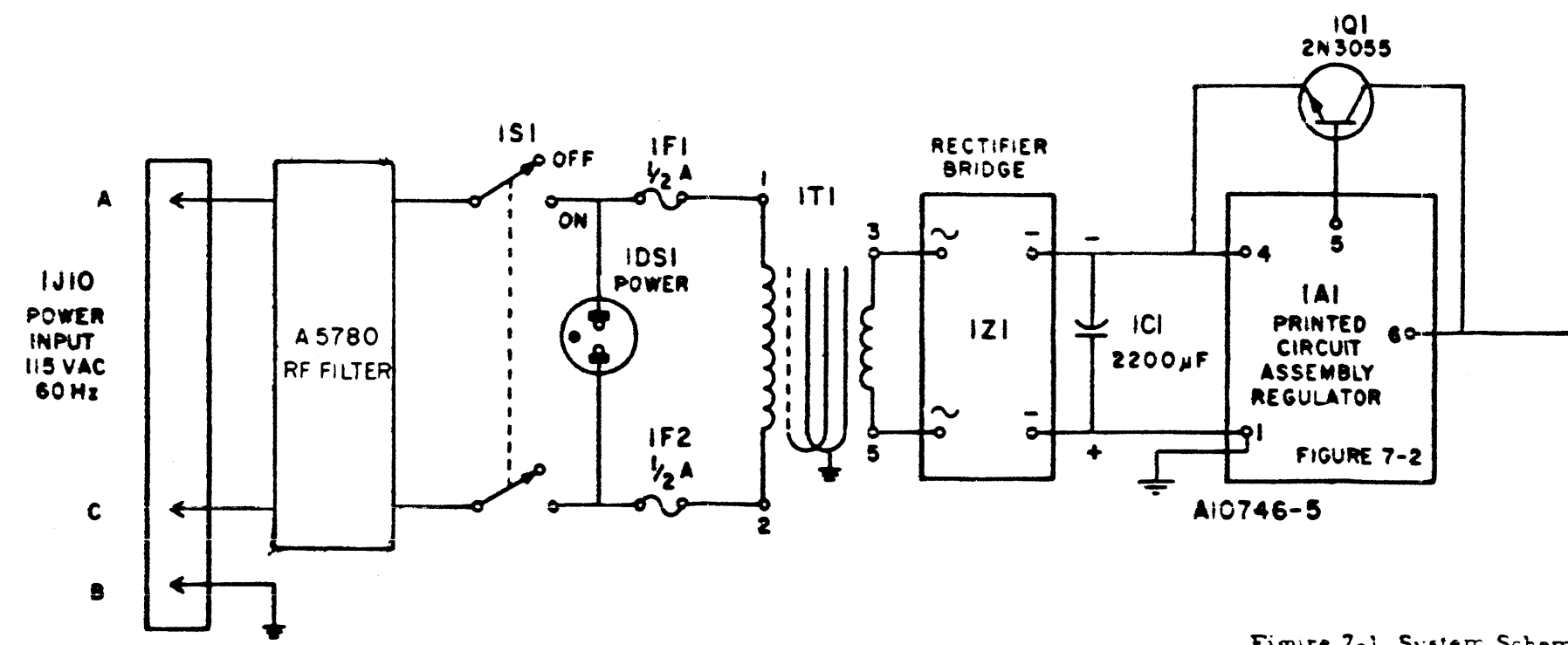
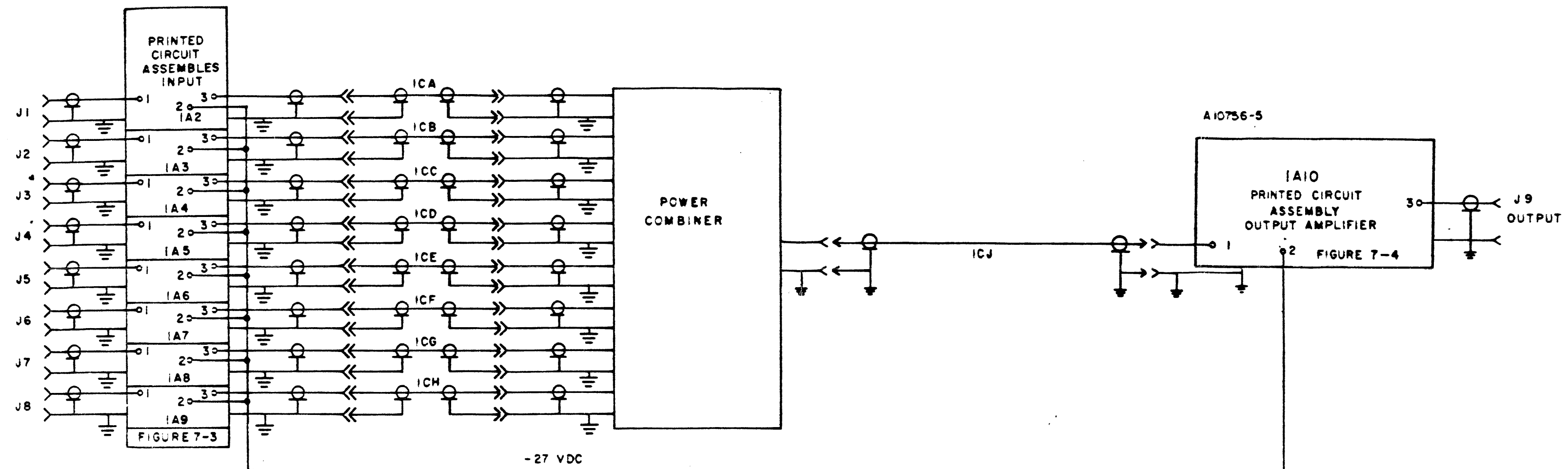
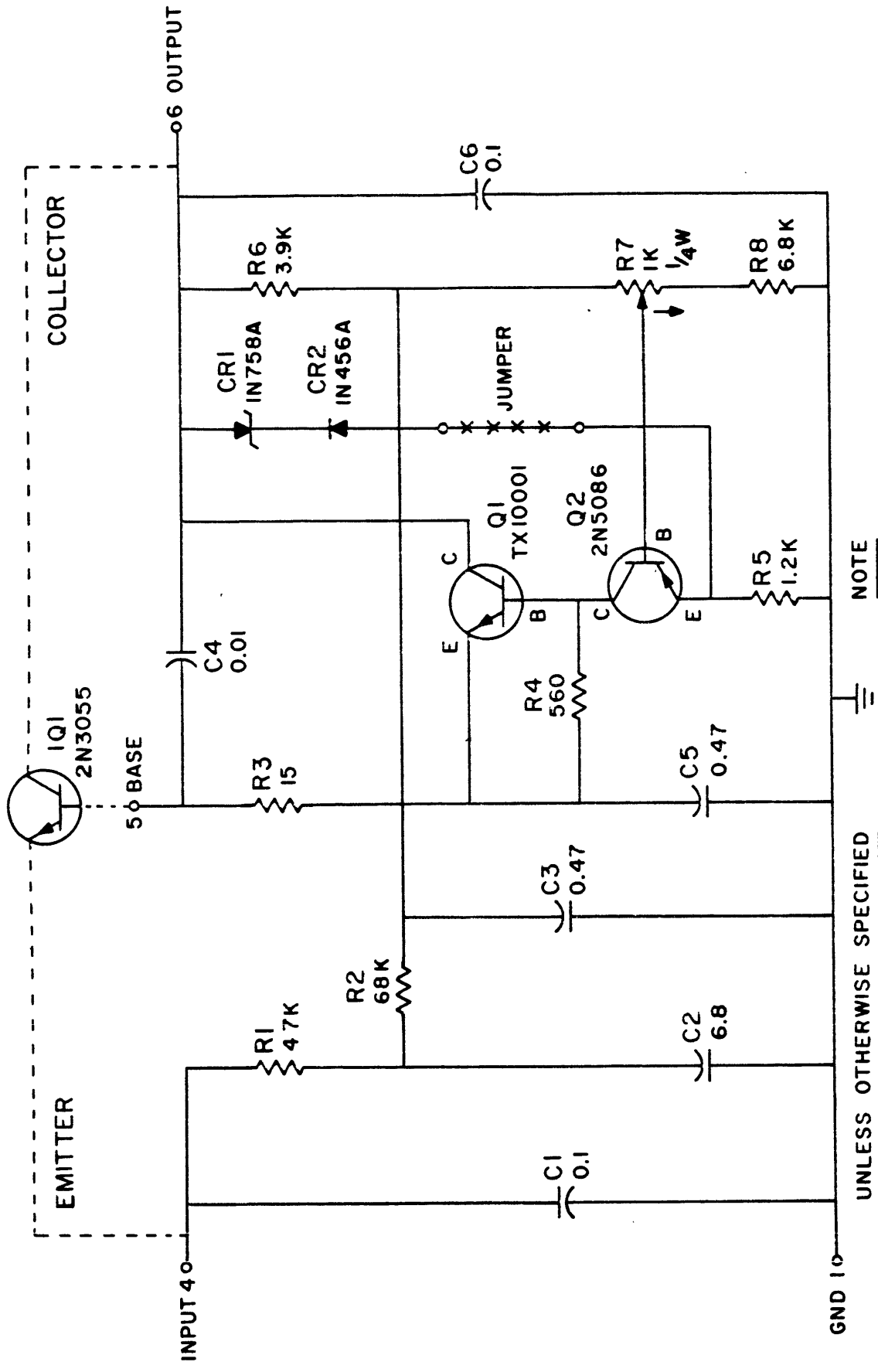


Figure 7-1 System Schematic, MAC-2



UNLESS OTHERWISE SPECIFIED
 RESISTANCE IN OHMS 5%, 1/2W
 CAPACITANCE IN μ F
 INDUCTANCE IN μ H

NOTE
 ALL COMPONENTS PREFIXED
 BY FIGURES 1A1 IN PARTS LIST

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

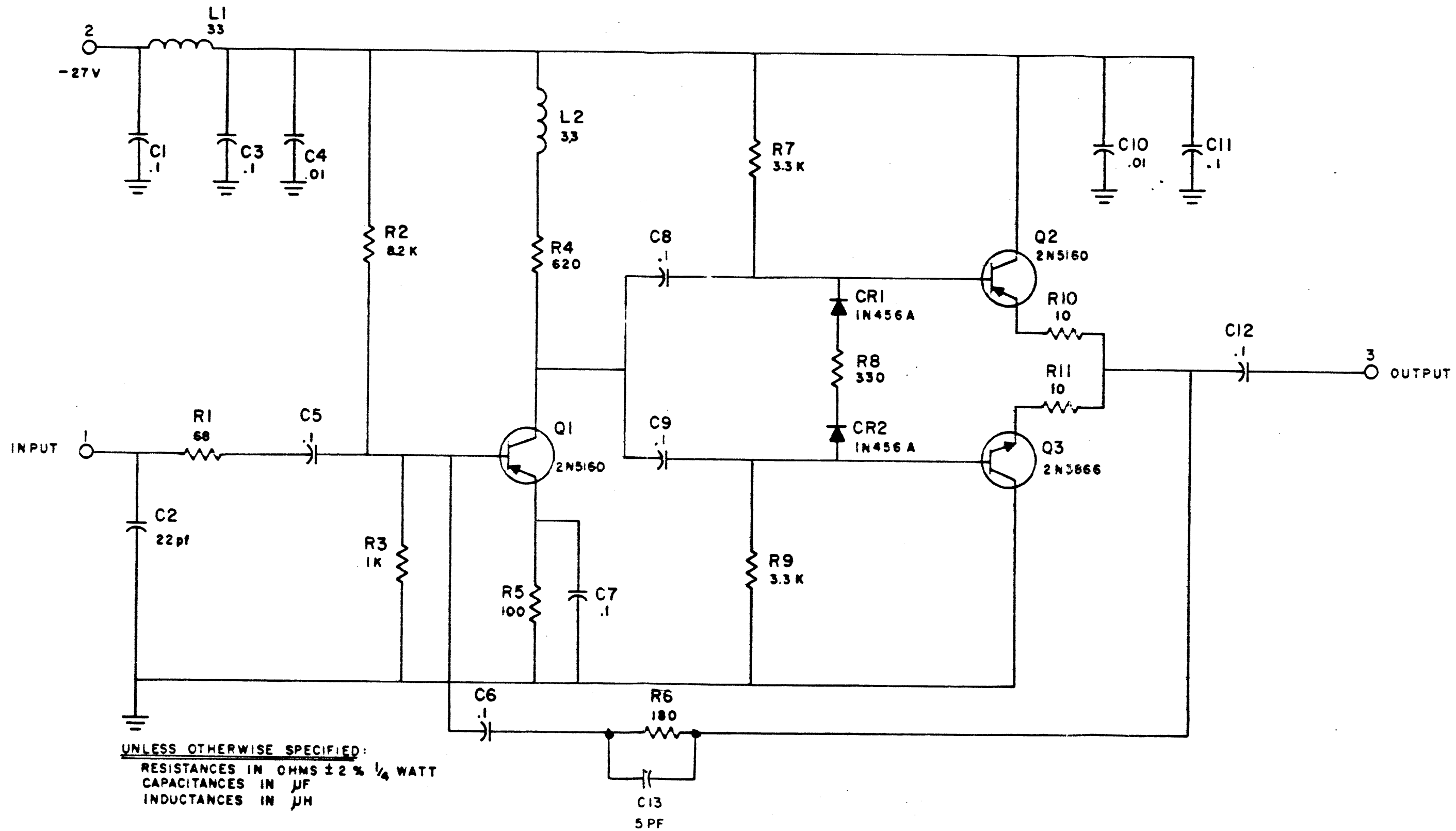


Figure 7-3 Preamplifier Schematic (1A2 through 1A9)

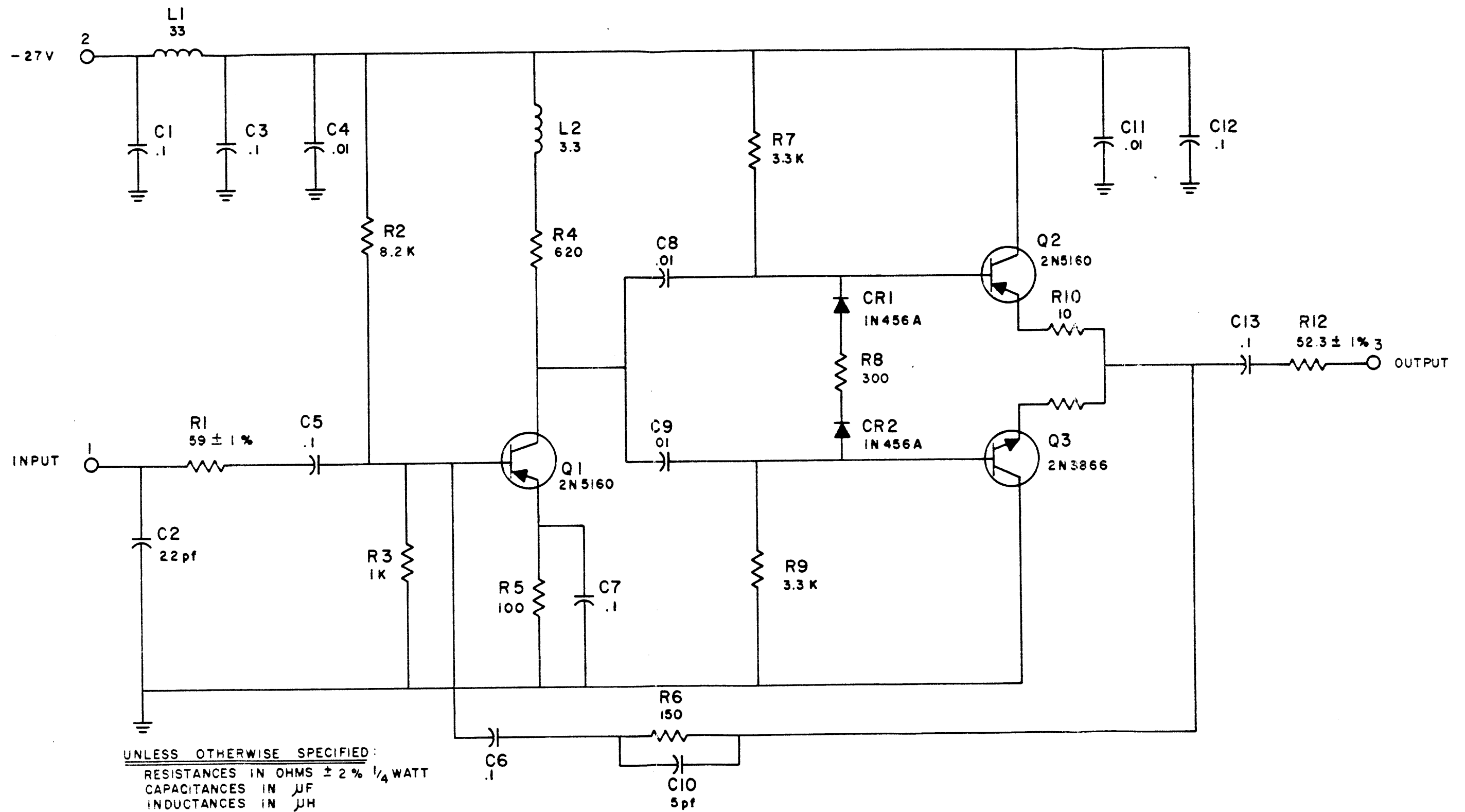


Figure 7-4 Output Amplifier Schematic (1A10)