TECHNICAL MANUAL

FOR

ANTENNA MULTICOUPLER

MODEL AMC-102

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. **OTTAWA, CANADA**

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NOTICE

THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS
700 FENIMORE ROAD MAMARONECK, N. Y.

Warranty

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:

1. That 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.
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.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

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. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

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.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By

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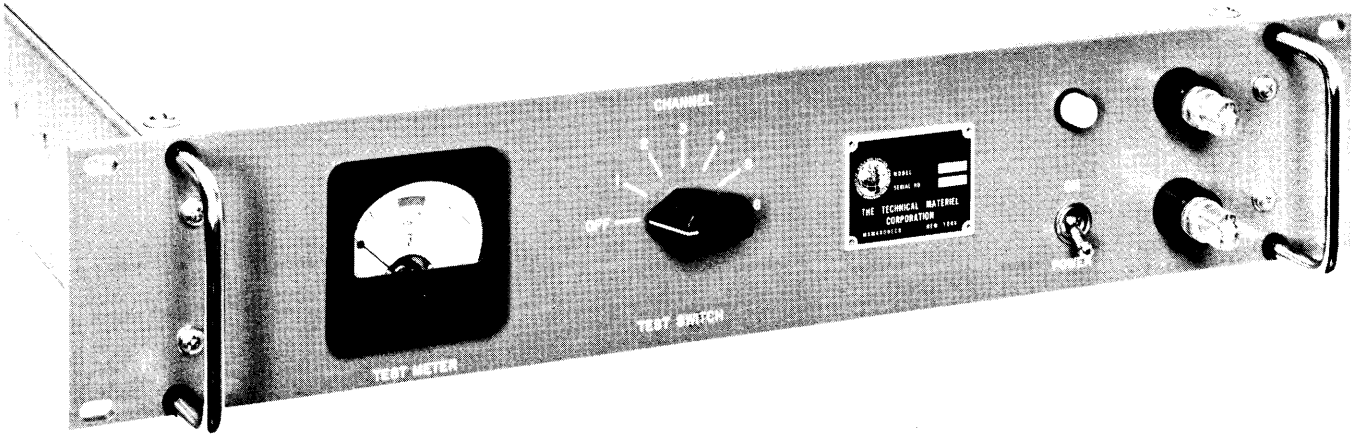

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Figure 1-1. Antenna Multicoupler, Model AMC-102

SECTION 1

GENERAL INFORMATION

1-1. FUNCTIONAL DESCRIPTION

Antenna Multicoupler, Model AMC-102, is a broad-band antenna coupling device normally used for connecting up to six independently operated receivers to a single antenna. The operating frequency range is 2 to 30 mc with rejection of signals outside this range. Antenna and receivers may be remotely located from the Multicoupler. Input and output impedances are 50 ohms each. Gain through the AMC-102 for each receiver is +3db. A front panel output level indicator and selector switch is included for testing the output signal level to each receiver. The unit contains its own power supply section.

1-2. PHYSICAL DESCRIPTION

The AMC-102 (see figure 1-1) is a 19-inch rack modular unit. Solid state circuitry is used throughout, employing printed circuit component boards for functional sections. The front panel is 19 inches wide x 3-1/2 inches high x 3/16 inches thick, and is finished in TMC gray enamel. The chassis extends 9 inches behind the panel. Weight of the complete unit is 12 pounds.

1-3. TECHNICAL SPECIFICATIONS

Frequency range:	2 to 30 mc
Gain:	3 db
Frequency response:	±1db, 2 to 30 mc
Uniformity of outputs:	±0.5 db
Input SWR:	1.5: 1 or less
Input impedance:	50 ohms
Output impedance:	50 ohms
Noise figure:	6db minimum 7db maximum

1-3. TECHNICAL SPECIFICATIONS (CONT)

Intermodulation:	60db below two 0.5-volt signals
Output to output isolation:	40db minimum
Overload:	3 volts continous will not cause component failure
Lightning protection:	Shunt and series
Powerline filters:	Greater than 60db down from 150 kc to 400 mc.
Environmental:	-40 to +50°C operating. (-60° to +80° storage). 0 to 95% relative humidity.
Input and output connectors:	Type N coaxial.
Power input:	115/230 ±10% ac volts RMS, 47 to 63 cps. Approximately 20 watts dissipation.
Size:	3-1/2 inches high x 19 inches wide x 9 inches deep.
Weight:	12 pounds

SECTION 2

INSTALLATION

2-1. INITIAL INSPECTION

Each AMC-102 has been thoroughly checked and tested at the factory before shipment. Upon arrival at the operating site, inspect case and its contents immediately for possible damage. Unpack the equipment carefully; inspect all packing material for parts which may have been shipped as loose items.

With respect to damage to the equipment for which the carrier is liable, The Technical Materiel Corporation will assist in describing methods of repair and the furnishing of replacement parts.

2-2. MECHANICAL INSTALLATION

Overall dimensions and mounting data are shown in figure 2-1. The Multicoupler mounts in a standard 19-inch equipment rack supported by its front panel and may be located any place that does not exceed the environmental temperature and humidity ranges listed in paragraph 1-3, TECHNICAL SPECIFICATIONS. Antenna and receivers may be located remotely from the AMC-102.

2-3. ELECTRICAL INSTALLATION

a. GENERAL - Make all electrical connections at the rear panel of the chassis (see figure 2-2). Type N coaxial mating plugs (TMC #UG-21D/U) are supplied in shipment for all r-f connections; TMC #1001-71 cable assembly is supplied for the a-c power line input. Any or all receiver connectors may be used. For best operation, connect all GND points (on the rear panel) together with heavy bus wire.

b. 115 VS. 230 VAC LINE - The AMC-102 leaves the factory wired for a 115 VAC line input, unless otherwise specified. A simple conversion to a 230 VAC

line may be made, however, by rearranging jumpers at the input transformer primary coils as shown in figure 7-1.

c. INITIAL ADJUSTMENTS - No initial adjustments or alignments are necessary prior to the operation of the AMC-102.

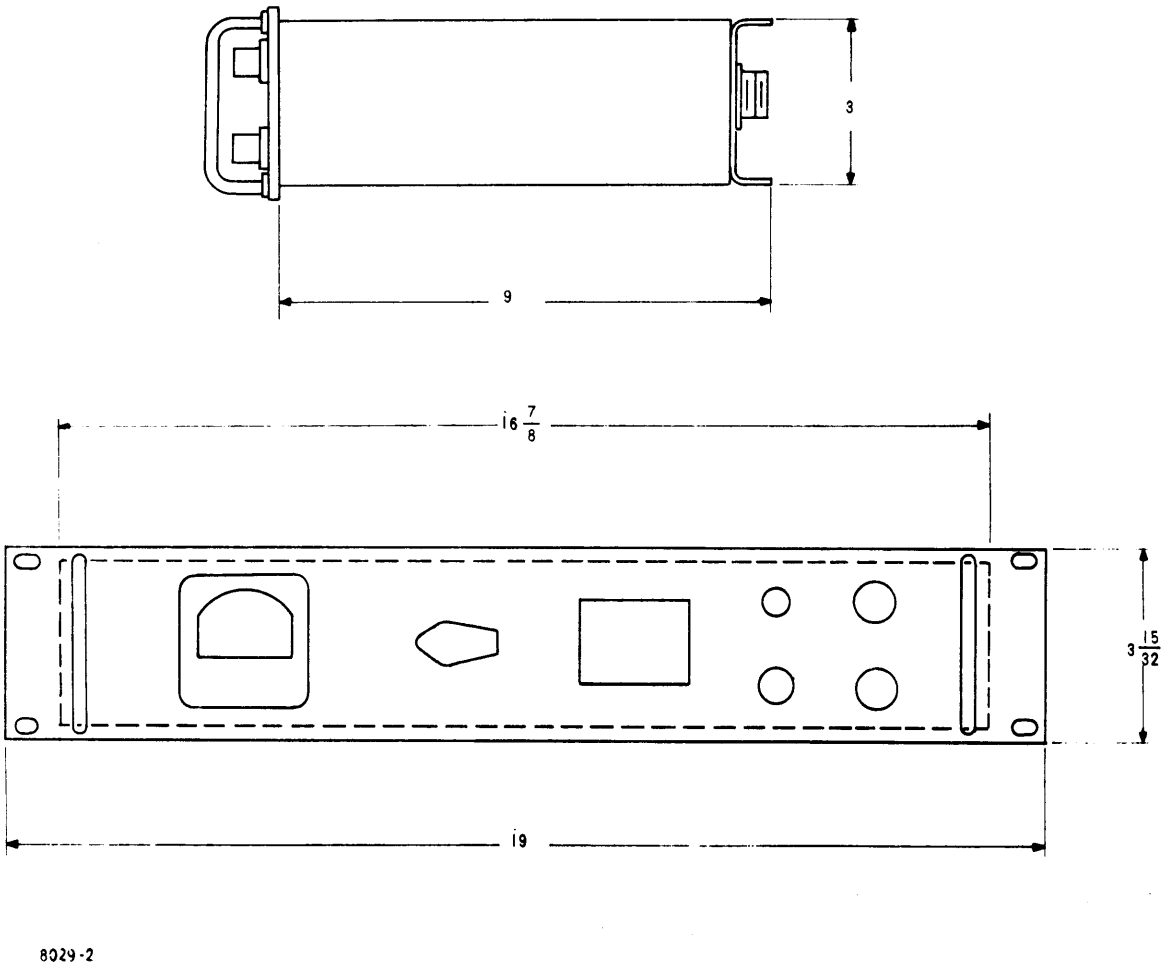

Figure 2-1. Outline Dimensions, AMC-102

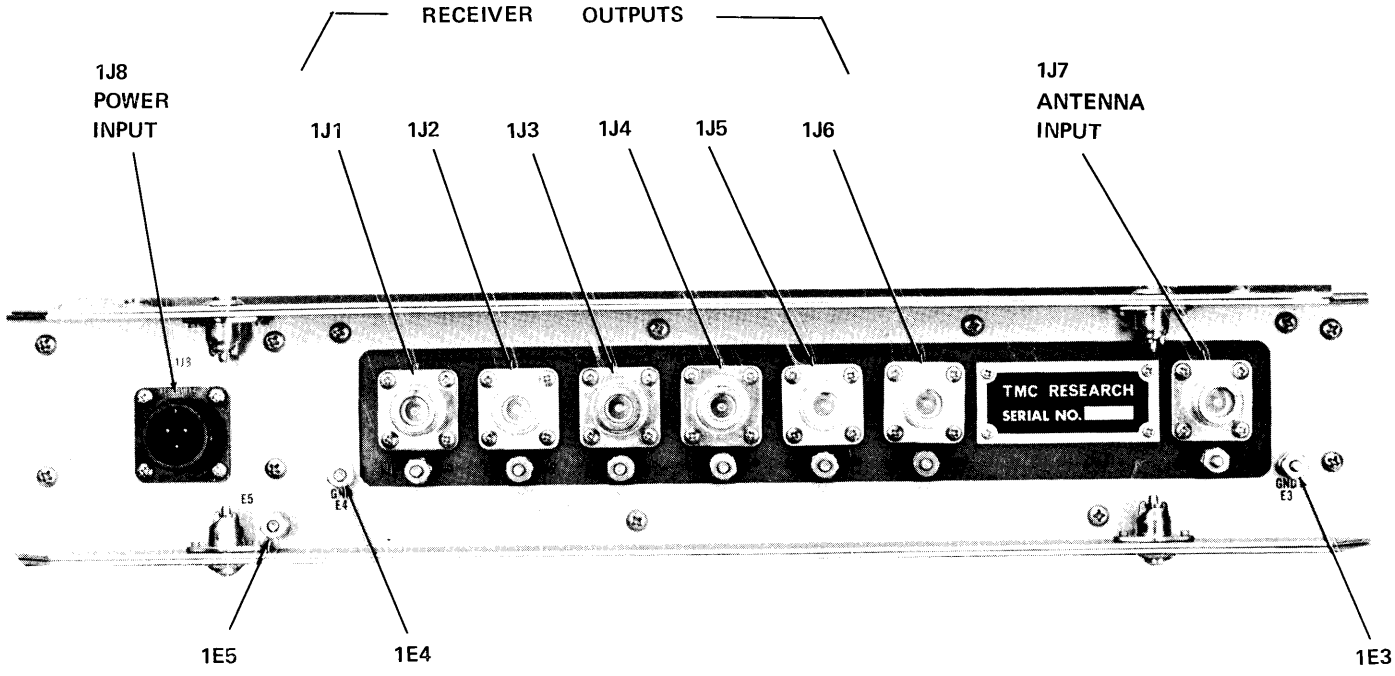

Figure 2-2. Rear Panel Connectors

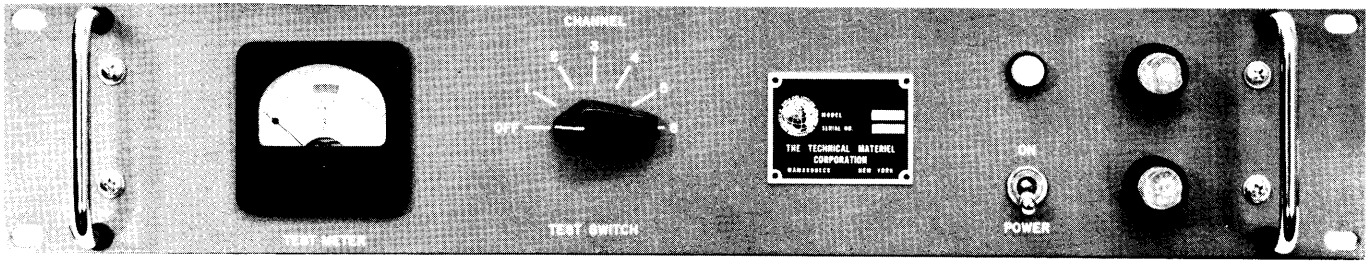

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Figure 3-1. Front Panel Controls, AMC-102

SECTION 3

OPERATOR'S SECTION

3-1. GENERAL

The AMC-102 control panel is shown in figure 3-1. The unit is set into operation by placing the POWER switch at ON position. The light above the switch indicates that the power supply section is receiving power from the power transformer secondary coils. Keep TEST SWITCH set at OFF, unless checking the AMC-102 (see paragraph 3-2).

3-2. OPERATOR'S MAINTENANCE

A TEST METER and TEST SWITCH on the front panel (see figure 3-1) supply the operator with a quick checking device for a properly operating AMC-102. Setting the TEST SWITCH to one of the six CHANNEL positions replaces the antenna input with a test signal from a test oscillator within the AMC-102. Each CHANNEL position connects the output of a channel to the TEST METER; a properly operating channel will produce a meter reading within the green zone of the dial if a receiver is connected to that output. If there is no receiver and only the transmission cable (or a 50-ohm dummy load) is present at the channel output, the meter reading will be slightly above the green zone. In either case, a reading below the green zone indicates a malfunctioning of that channel.

Two light indicator-fuses on the front panel notify the operator of current overdraw or a short in the a-c line voltage input. A light indicats a blown fuse. To replace fuse cartridge (1/4 amp, slo-blow) remove indicator-cap, pull out old cartridge, insert new cartridge and replace cap. Before replacing a fuse, check wiring for possible cause of short.

SECTION 4

PRINCIPLES OF OPERATION

4-1. FUNCTIONAL ANALYSIS (figure 4-1)

PC (Printed circuit) boards 1A1 through 1A8 function to filter, amplify, and distribute the signals to the receivers. Signals from the antenna are applied to the input filter located in PC board 1A7. This filter passes signals only in the 2-to 30-mc frequency range. The signals are then amplified by pre-amplifier 1A8 and applied simultaneously to the inputs of output amplifiers 1A1 through 1A6.

A test oscillator (also located in 1A7) TEST METER and TEST SWITCH function to provide an in-operation check of signal continuity through any particular channel of the AMC-102. With the TEST SWITCH set at one of the 1-6 CHANNEL positions, the test oscillator is enabled and its output into the filter in 1A7 replaces the antenna input. In accordance with which channel was selected, a sample output of that channel output amplifier is connected to the TEST METER. The meter indicates the level and includes a green band on its dial to indicate a normal level for a properly operating channel throughout the AMC-102.

PC board 1A9 power supply furnishes the d-c operating voltages for boards 1A1 through 1A8.

4-2. CIRCUIT ANALYSIS (figure 7-1)

a. RELAY AND INPUT FILTER (1A7) - Relay K1 controls the input to the filter section; TEST SWITCH S2B controls the relay. With switch S2B in the OFF position, the +24V supply for the relay coil is disconnected and contacts of the de-energized relay connect the antenna input directly to the filter and ground out the output of the test oscillator (Q1,Q2). With S2B in one of the six

CHANNEL positions, the +24V supply is connected across the K1 coil and the output of the antenna is grounded and replaced with the test oscillator output at the filter.

The input filter is composed of 1A7L1 through 1A7L7, 1A7C1 through 1A7C9, 1A7C17 and 1A7C18. These components form a bandpass filter for the 2-to-30-mc frequency range with a response curve that is flat within ±1db. Values of these components are critical.

b. PREAMPLIFIER (1A8) - Preamplifier 1A8 functions to obtain a low-noise amplification of the signals. The output from the input filter in 1A7 is coupled to the input of 1A8 via broadband transformer 1A8T1. There is approximately a 10-db voltage gain produced by the transformer. The signals from 1A8T1 are brought to the base of transistor 1A8Q1. 1A8Q1 provides power gain to drive transistors 1A8Q2 and 1A8Q3, although the voltage gain through 1A8Q1 is unity. The signals are then coupled from the emitter of 1A8Q1 to the base of 1A8Q3 and then through r-f coupling capacitor 1A8C3 to the base of transistor 1A8Q2. 1A8Q2 and Q3 operate as complimentary amplifiers and provide further power gain to the signals.

c. OUTPUT AMPLIFIERS (1A1 THRU 1A6) - The six output amplifier circuits provide isolation between output jacks 1J1 through 1J6 and the necessary power gains to drive the required load impedances. Because all circuits are identical, a typical amplifier (1A1) is described in the following paragraph.

The signal is applied to the bases of transistors 1A1Q1 and 1A1Q2 through an inductor (1A1L2) which forms a low pass filter with the input impedance of transistors. 1A1Q1 and Q2 operate as complementary power amplifiers. The signal is then coupled to output jack 1J1 through transformer 1A1T1. A level-sampling circuit (made up of resistors 1A1R8 and R9, capacitors 1A1C4 and C5 and diode 1A1CR3) is used for a meter reading (see paragraph 4-2d., Test Circuits).

d. TEST CIRCUITS (1A7) - The test circuits are used to check for normal system operation. Components are a test oscillator in PC board 1A7, a level-sampling circuit in each output amplifier, TEST METER 1M1 and TEST SWITCH 1S2. The test oscillator is switched in to substitute a test signal for the antenna signal and a meter reading of signal level is taken for each channel from the output of the channel output amplifier.

The test oscillator section is made up of transistors 1A7Q1 and Q2 and associated components. The oscillator is composed of transistor 1A7Q1; frequency determining components are inductor 1A7L8 and capacitors 1A7C13 and C14. Transistor 1A7Q2 is a buffer amplifier and applies the signal to the input filter via resistor 1A7R7 and capacitor 1A7C16. TEST SWITCH 1S2B, besides connecting the oscillator output into the input filter (paragraph 4-2a), also supplies the +24V enabling voltage to the oscillator circuits when it is set in one of the CHANNEL positions. When the switch is set at OFF, the +24V is disconnected and the oscillator is disabled.

The test output section is composed of part of TEST SWITCH 1S2, level-sampling circuits in the output amplifiers (paragraph 4-2c) and TEST METER 1M1. Wafer "B" (1S2B) of the TEST SWITCH, when placed in one of the CHANNEL positions, removes a +24V reverse bias from the level-sampling circuit of that channel. Wafer "A" (1S2A) then connects the output of the channel level-sampling circuit to the TEST METER.

e. POWER SUPPLY (1A9) - Circuitry in P/C board 1A9 develops a +24V power supply for the AMC-102 Multicoupler. A rectified voltage from a diode bridge (1A9CR1 through CR4) is applied to a filter consisting of 1A9 C1, C2, C3, R2 and R3. Transistors 1Q1 and 1Q2 are voltage regulators and transistor 1A9Q1 is the output amplifier. Zener diode 1VR1 and resistor 1A9R5 are used to establish a voltage reference for 1A9Q1. 1A9Q1 functions as a difference amplifier; it compares its base voltage (derived by the resistive divider

chain 1A9R6, R7 and R8) to that of the reference voltage of Zener diode 1VR1. If there is a difference in these voltages, 1A9Q1 changes the amount of base current into 1Q2 and readjusts the output voltage until the voltages are the same. Resistor 1A9R4 limits the current from 1A9Q1. 1A9C4 and C5 are r-f bypass capacitors.

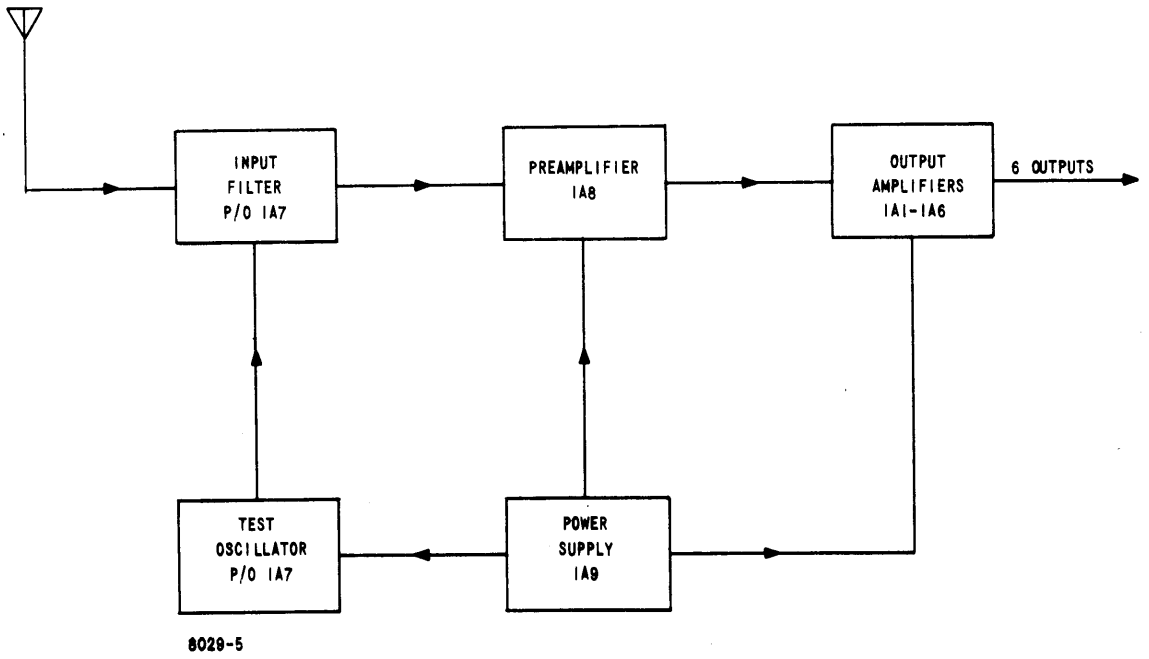

Figure 4-1. Functional Block Diagram, AMC-102

SECTION 5

MAINTENANCE

5-1. INTRODUCTION

This section includes recommended preventive maintenance, troubleshooting, realignment and repair procedures for AMC-102 Antenna Multicoupler.

5-2. TEST EQUIPMENT

Table 5-1 lists standard test equipment (or equivalents) to be used in maintenance of the AMC-102.

TABLE 5-1. TEST EQUIPMENT

Description	Manufacturer and Model
Multimeter	Simpson Model 260
Voltmeter	Millival Model MV28B

5-3. PREVENTIVE MAINTENANCE

a. In order to prevent equipment failure due to dust, dirt and other destructive elements, it is suggested that a schedule of preventive maintenance be set up and adhered to.

b. At periodic intervals, the equipment should be removed from its mounting for cleaning and inspection. All accessible covers should be removed and the wiring and all components inspected for dirt, corrosion, charring, discoloring or grease. Remove dust with a soft brush or vacuum cleaner. Remove dirt or grease from other parts with any suitable cleaning solvent. Use of carbon tetrachloride should be avoided due to its highly toxic effects. Trichlorethylene or methylchloroform may be used, providing the necessary precautions are observed.

WARNING

When using toxic solvents, make certain that adequate ventilation exists. Avoid prolonged or repeated breathing of the vapor. Avoid prolonged or repeated contact with skin. Flammable solvents shall not be used on energized equipment or near any equipment from which a spark may be received. Smoking, "hot work", etc. is prohibited in the immediate area.

5-4. TROUBLESHOOTING

a. REFERENCE AIDS - Reference data included in this manual as an aid in troubleshooting include wiring schematic diagrams (in Section 7), principles of operation (Section 4), component location diagram (figure 5-1), a troubleshooting chart (table 5-3), a stage gain chart (table 5-6), a voltage measurement table (table 5-4), a resistance measurement chart (table 5-5) and a general sequential procedure to follow in troubleshooting the AMC-102 (paragraph 5-4b).

b. GENERAL PROCEDURE - The quickest procedure in locallizing and pin-pointing the area of trouble in the AMC-102 is the performance of the steps in table 5-2 (using the front panel TEST METER and TEST SWITCH) and reference to the Troubleshooting Chart, table 5-3. For this check, each AMC-102 receiver output (1J1 through 1J6) should be connected either to a receiver or to a 50-ohm-transmission line alone, in order that the output may be properly terminated. If neither of these are avilable, a 51-ohm resistor may be substituted. For voltage measurements, to gain access to test points located on P/C boards 1A1 through 1A6, remove the board mounting screws and pull board out as far as wire harness service loop will allow. In cases in which the test point is still not accessible, free board by unsoldering the few wires connecting it (a maximum of 6) and reconnect the board to the circuitry by using temporary wire extensions. Resistance measurements at boards 1A1 through 1A6 must be made with the board disconnected from the circuit.

TABLE 5-2. FRONT PANEL CHECK

STEP	PROCEDURE	NORMAL INDICATION
1	Set TEST SWITCH at OFF and POWER switch at ON position.	Power lamp lights.
2	Observing TEST METER, set TEST SWITCH at CHANNEL 1 position.	Reading is within green area or slightly above.*
3	Repeat Step 2 for CHANNELS 2 through 6.	Reading is within green area or slightly above.*

* If only transmission line is present at output, reading will be slightly above green area.

TABLE 5-3. TROUBLESHOOTING CHART

INDICATION (FROM TABLE 5-2)	PROBABLE TROUBLE	PROCEDURE
One of channel positions on TEST SWITCH shows an indication below green area on TEST METER.	A defective output amplifier board (among 1A1 through 1A6) corresponding with low indication. For example, if channel 2 indicates low, board 1A2 is at fault.	Make voltage and resistance checks on on the indicated board per paragraphs 5-4c and 5-4d.
More than one channel indicates low (as in above but at least one channel indicates normally.	Defective output amplifier boards corresponding with low indications.	Make voltage and resistance checks on the indicated boards per paragraphs 5-4c and 5-4d.
No or low indication of all channels on TEST METER.	Power supply board 1A9 defective.	Make voltage and resistance checks on 1A9 per paragraphs 5-4c and 5-4d.
	Test oscillator in board 1A7 defective.	Make voltage and resistance checks on oscillator section of board 1A7 per paragraphs 5-4c and 5-4d.
	Input relay and/or filter section of board 1A7 defective.	Make voltage, resistance and gain checks on input relay and/or filter sections of 1A7 per paragraphs 5-4c, d, and e.
	Preamplifier board 1A8 is defective.	Make voltage, resistance and gain checks on 1A8 per paragraphs 5-&c, d, and e.

c. VOLTAGE MEASUREMENTS -

CAUTION

This equipment is transistorized. When measuring voltages, use tape or sleeving (spagetti) to insulate the entire test prod, except for the extreme tip. A momentary short circuit can ruin a transistor.

In table 5-4 are listed typical voltage values for the AMC-102. When checking voltages, values should be within ±10% of values shown. Use voltmeter section of multimeter. All measurements are to be taken with AMC-102 set up for normal operation (TEST SWITCH OFF and POWER switch on).

TABLE 5-4. VOLTAGE VALUES

P/C BOARD	POINT OF TEST	
	TEST POINT	INDICATION
POWER SUPPLY 1A9	TP1	0 VDC
	TP2	+24 VDC
	TP3	+24 VDC
	TP4	-.26 VDC
	TP5	-4.5 VDC
	TP6	-24 VDC
	TP7	8 VAC
	TP8	18 VAC
	TP9	18 VAC
INPUT RELAY AND/OR FILTER SECTION OF BOARD 1A7	TP1	OVDC
	TP2	OVDC
	TP4	OVDC
	TP5	OVDC

TABLE 5-4. VOLTAGE VALUES (CONT)

P/C BOARD	POINT OF TEST	
	TEST POINT	INDICATION
TEST OSCILLATOR SECTION OF BOARD 1A7	TP3	0 VDC
	TP3	+24 VDC (with TEST SWITCH in any channel position).
PREAMPLIFIER 1A8	TP1	0 VDC
	TP2	+24 VDC
	TP3	+13 VDC
	TP4	0 VDC
	TP5	0 VDC
OUTPUT AMPLIFIER 1A1 THRU 1A6	TP1	0 VDC
	TP2	+24 VDC
	TP3	+13 VDC
	TP4	0 VDC
	TP5	0 VDC
	TP6	0 VDC

d. RESISTANCE MEASUREMENTS -

CAUTION

Before using any ohmmeter to test transistors or transistor circuits, check the open-circuit voltage across the ohmmeter test leads. Do not use the ohmmeter if the open-circuit voltage exceeds 1.5 volts.

In table 5-5 are listed typical resistance values for the AMC-102 together with tolerances to be expected. Resistance measurements on boards 1A1 through 1A6 must be made with boards disconnected from circuitry. Two columns of figures are given, one with a reversed polarity. Use ohmmeter section of multimeter with range settings as shown.

TABLE 5-5. RESISTANCE VALUES

TRANSISTOR AND LOCATION	FROM BASE (-)				FROM BASE (+)			
	TO EMITTER (+)		TO COLLECTOR (+)		TO EMITTER (-)		TO COLLECTOR (-)	
	RES (OHMS)	OHMMETER RANGE	RES (OHMS)	OHMMETER RANGE	RES (OHMS)	OHMMETER RANGE	RES (OHMS)	OHMMETER RANGE
1A9Q1 (1A9)	200±15%	RX100	200±15%	RX100	1.1K±15%	RX100	1.1K±15%	RX100
1Q1 (FIG 5-1)	100±15%	RX100	100±15%	RX100	20K±20%	RX100	1.3K±15%	RX100
1Q2 (FIG 5-1)	100±15%	RX100	100±15%	RX100	470±15%	RX100	20K±20%	RX100
1A7Q1 (1A7)	2.5K±15%	RX100	1.7K±15%	RX100	1K±15%	RX100	700±15%	RX100
1A7Q2 (1A7)	2.5K±15%	RX100	1.5K±15%	RX100	900±15%	RX100	800±15%	RX100
1A8Q1 (1A8)	1K±15%	RX100	1K±15%	RX100	3.5K±15%	RX100	1.4K±15%	RX100
1A8Q2 (1A8)	25K±20%	RX10,000	2.3K±15%	RX100	1K±15%	RX100	800±15%	RX100
1A8Q3 (1A8)	1.1K±15%	RX100	1.1K±15%	RX100	25K±20%	RX10,000	1K±15%	RX10
1A1 THRU 1A6:								
Q1	390±15%	RX10,000	2.3K±15%	RX100	1K±15%	RX100	800±15%	RX100
Q2	1.1K±15%	RX100	1.1K±15%	RX100	270±20%	RX10,000	2.4K±15%	RX100

e. STAGE GAIN MEASUREMENTS - Stage gain measurements are made throughout the AMC-102 by utilizing the built-in test oscillator in P/C board 1A7 as a convenient input test signal. Stage gains will be measured by dividing the voltage level at each test point (TP) by the level at the test oscillator output (TP6 of 1A7); this output should be checked first and should read approximately 0.410VRMS.

To make measurements, set the POWER switch at ON and the TEST SWITCH at CHANNEL 1. Connect the voltmeter between each indicated test point and ground listed in table 5-6. Agreement within ±10% of typical stage gains in the chart indicates normal operation.

f. CHECKING PRINTED CONDUCTORS - Breaks in the conducting strip (foil) on a printed circuit card can cause permanent or intermittent trouble. In many instances, these breaks will be so small that they cannot be detected by the naked eye. These almost invisible cracks (breaks) can be located only with the aid of a powerful magnifying glass.

To check out and locate trouble in the conducting strips of a printed circuit board, set up a multimeter (one which does not use a current in excess of 1 ma) for making point-to-point resistance tests, using needle point probes. Insert one point into the conducting strip, close to the end of terminal, and place the other probe on the terminal or opposite end of the conducting strip. The multimeter should indicate continuity. If the multimeter indicates an open circuit, drag the probe along the strip (or if the conducting strip is coated, puncture the coating at intervals) until the multimeter indicates continuity. Mark this area; then use a magnifying glass to locate the fault in the conductor.

CAUTION

Before using an ohmmeter for testing a circuit containing transistors or other voltage-sensitive semiconductors, check the current it passes under test on all ranges. DO NOT use a range that passes more than 1 ma.

TABLE 5-6. STAGE GAIN MEASUREMENTS

Stage	Test Point and Location	Voltage		Stage Gain (E2/E1)
		Osc. Level (E1)	TP Level (E2)	
Test oscillator in 1A7	TP6 of 1A7	0.410		
Up to input filter in 1A7	TP4 of 1A7	0.410	0.410	1/1 = 1
Up to broadband transformer in 1A8	TP6 of 1A8	0.410	1.10	2.68/1 = 2.68
Up to 1A8 output	TP3 of 1A8	0.410	1.10	2.68/1 = 2.68
Overall-CHANNEL 1	1J1 on rear panel (fig 2-2)	0.410	1.10	2.68/1 = 2.68
Overall-CHANNELS 2 thru 6	1J2 thru 1J6 on rear panel (fig 2-2)	Same as for CHANNEL 1		

5-5. ALIGNMENT

The only alignment adjustment in the AMC-102 is a potentiometer adjustment to obtain the +24V output from the power supply board (1A9). This adjustment is made in the factory before shipment and a readjustment becomes necessary only if there has been a replacement of components on board 1A9.

To readjust the power output, connect the multimeter leads between pin 1 (GND) and pin 2 (+24VDC) of board 1A9. Adjust 1A9R7 potentiometer for a 24-volt indication on the multimeter.

5-6. REPAIR

a. GENERAL PARTS REPLACEMENT TECHNIQUES - Removing and replacing components or repairing printed conductors on the P/C boards requires removal of the defective

board from the chassis. To remove the defective board, unsolder the connecting wires; then remove the screws that hold the board in place. For best results, in boards 1A1 through 1A6 and 1A8, remove the bracket that supports the board and the board from the chassis as a unit and, then when free, remove the bracket from the board.

b. TRANSISTOR PRECAUTIONS - Precautions should be taken to avoid inducing damaging voltages or heat into a transistor in the process of unsoldering and re-soldering. To do this, when unsoldering, use a pencil-type soldering iron with a 25-watt capacity. If only a-c irons are available, use an isolating transformer. Do not use a soldering gun for unsoldering. When re-soldering, solder quickly; where wiring permits, use a heat sink (such as long-nosed pliers) between the soldered joint and the transistor. Use approximately the same length and dress of transistor leads as used originally.

c. REPAIR OF PRINTED CONDUCTORS - If the break in the conductor strip is small, lightly scrape away any coating covering that area of the conducting strip to be repaired. Clean the area with a firm-bristle brush and approved solvent. Then repair the cracked or broken area of the conducting strip by flowing solder over the break. Considerable care must be exercised to keep the solder from flowing onto an adjacent strip.

If a strip is burned out, or fused, cut and remove the damaged strip. Connect a length of insulated wire across the breach or from solder-point to solder-point.

After the repairs are completed, clean the repaired area with a stiff brush and solvent. Allow the board to dry throughly, and then coat the repaired area with an epoxy resin or similiar compound. This coating not only will protect the repaired area, but will help to strengthen it.

CAUTION

After repairs, check the board for solder drippings; they may cause shorts.

Frequently, a low-resistance leakage path will be created by moisture and/or dirt that has carbonized onto the phenolic board. This leakage can be detected by measuring the suspected circuit with a multimeter. To overcome this condition, thoroughly clean the carbonized area with a solvent and a stiff brush. If this does not remove it, use a scraping tool (spade end of a solder-aid tool or its equivalent) to remove the carbon, or drill a hole through the leakage path to break the continuity of the leakage. When the drilling method is used, be careful not to drill into a part mounted on the other side.

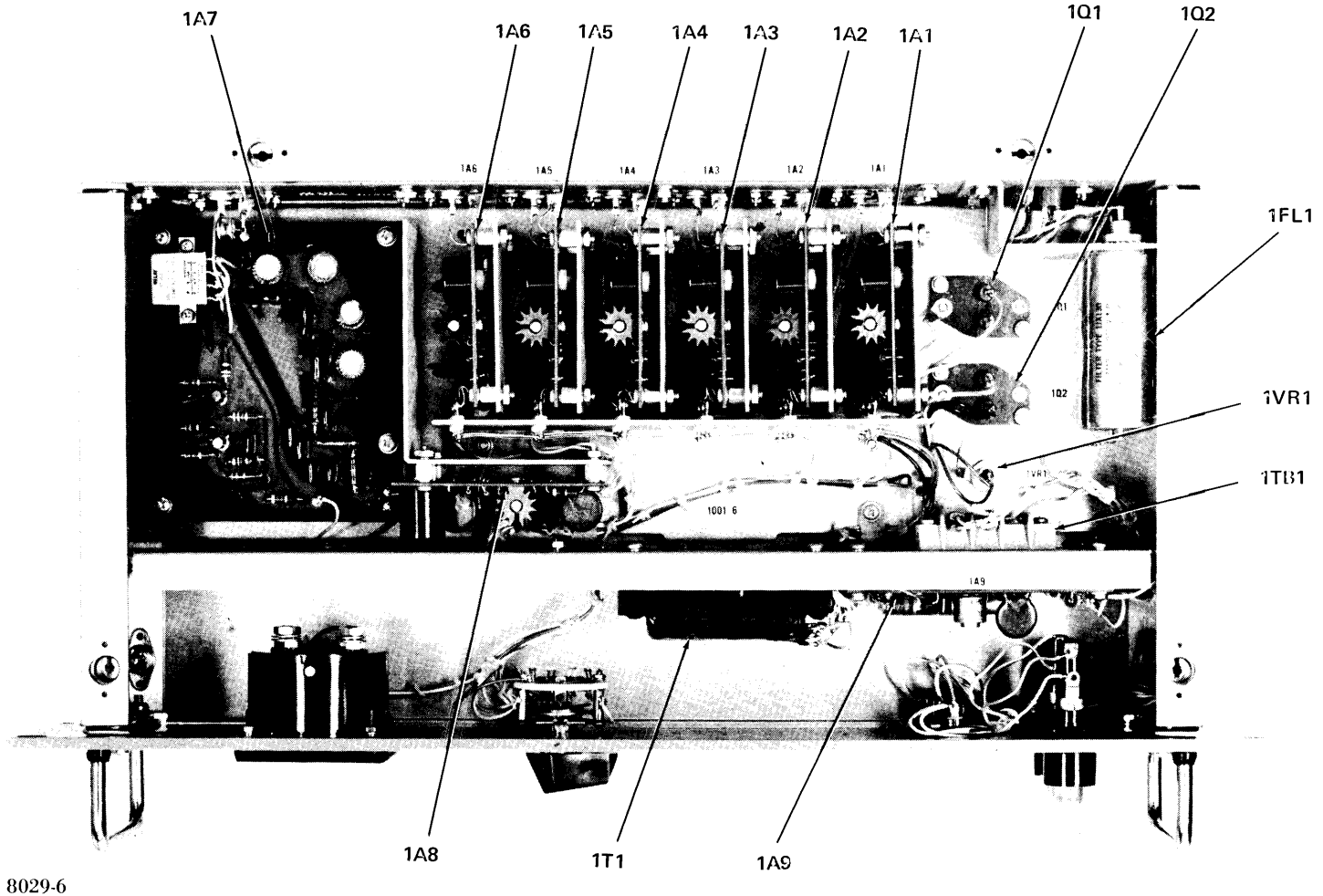

Figure 5-1. Major Component Location Diagram, Top View, AMC-102

SECTION 6

PARTS LIST

6-1. INTRODUCTION

The parts list presented in this section is a cross-reference list of parts identified by a reference designation and TMC part number. Parts appearing on schematic diagrams are assigned reference designations. Wherever practicable, the reference designation is marked on the equipment, close to the part it identifies. In most cases, mechanical and electro-mechanical parts have TMC part numbers stamped on them.

To expedite delivery when ordering any part, specify the following:

a. Referency symbol.

b. Description as indicated in parts list.

c. TMC part number.

d. Model and serial numbers of the equipment containing the part being replaced; this can be obtained from the equipment nameplate.

For replacement parts not covered by warranty (refer to warranty sheet in front of manual), address all purchase orders to:

The Technical Material Corporation
Attention: Sales Department
700 Fenimore Road
Mamaroneck, New York

PARTS LIST

for

ANTENNA MULTICOUPLER, AMC-102

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
1A1	PRINTED WIRING BOARD ASSY: Output Amplifier	1001-24(3)
1A2 thru 1A6	Same as 1A1	
1A7	PRINTED WIRING BOARD ASSY: Input Filter and Test Oscillator	1001-22(3)
1A8	PRINTED WIRING BOARD ASSY: Preamp	1001-23(3)
1A9	PRINTED WIRING BOARD ASSY: Power Supply	1001-30(3)
1DS1	LIGHT INDICATOR ASSY	MS25256-10-327
1E1	VOLTAGE PROTECTOR	1001-64
1F1	FUSE CARTRIDGE: 1/4 ampl, slo-blo	FO2B250V 1/4S
1F2	Same as 1F1	
1FL1	FILTER, RADIO INTERFERENCE	1JX130
1FL2	Same as 1FL1	
1J1	CONNECTOR, RECEPTACLE: Type N, coaxial, male	UG-58A/U
1J2 thru 1J7	Same as 1J1	
1J8	CONNECTOR, RECEPTACLE: 3-pin, male, box mounting.	MS3102E14S-7P
1M1	METER ASSY: milliampere	MR100-9
1Q1	TRANSISTOR, POWER	2N297A
1Q2	Same as 1Q1	
1S1	SWITCH, TOGGLE: DPST	MS35059-22
1S2A	SWITCH, SELECTOR: rotary, wafer, 12-pos.	PA-2001
1S2B	Same as 1S2A	
1T1	TRANSFORMER, POWER	1001-53
1TB1	TERMINAL BLOCK	601GMF-3

PARTS LIST

for

ANTENNA MULTICOUPLER, AMC-102

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
1VR1	DIODE, VOLTAGE REGULATOR	1N2976B
1XF1	FUSEHOLDER ASSY	FNH20G
1XF2	Same as 1XF1	
1XQ1	SOCKET, TRANSISTOR	1001-54
1XQ2	Same as 1XQ1	

SECTION 7

WIRING SCHEMATICS

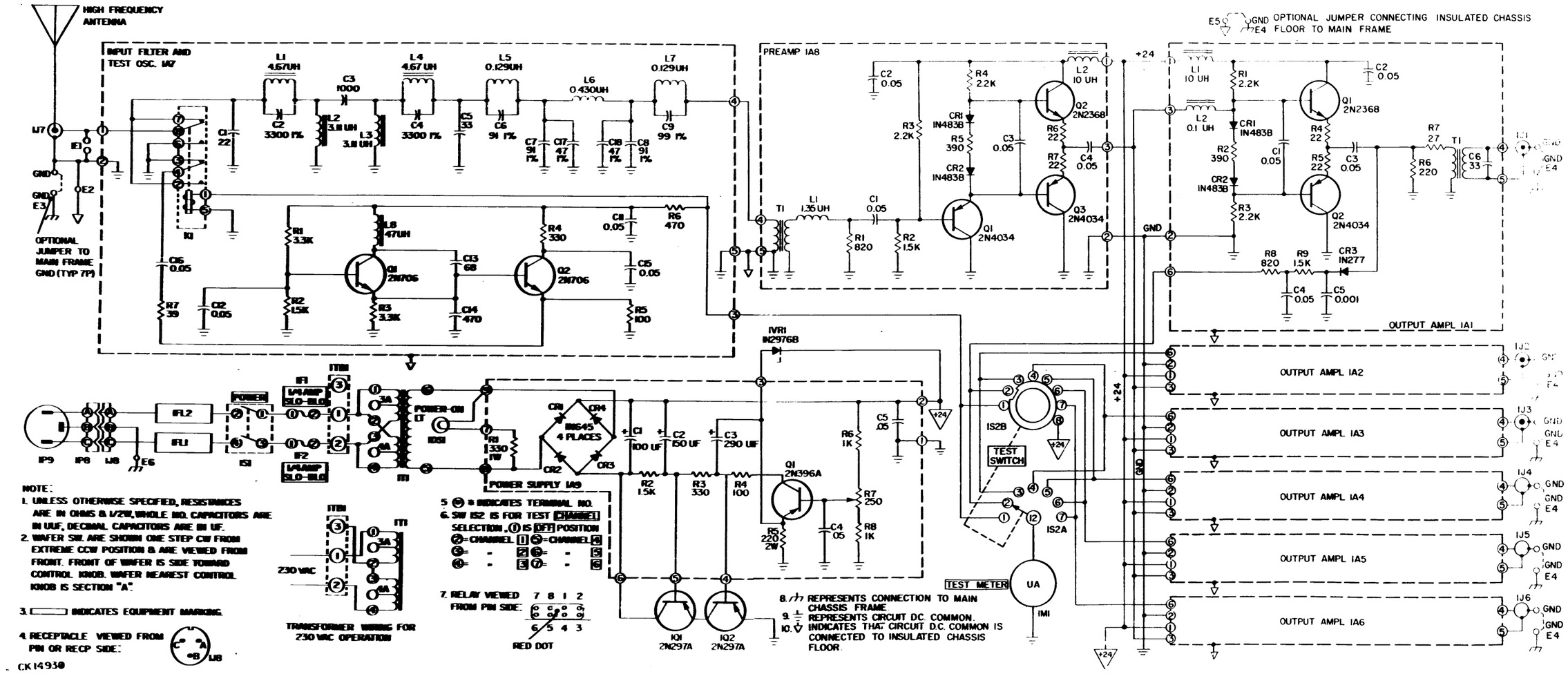

Figure 7-1. Wiring Schematic, AMC-102