TECHNICAL MANUAL

for

POWER SUPPLY
MODEL TPSA-1

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, CANADA

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NOTICE

CHANGE NO. _____

INSTRUCTION BOOK CHANGE NOTICE

Date _____

Manual affected: _____ IN _____

Model TPSA-1

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SHOULD ADDITIONAL COPIES OF THIS CHANGE NOTICE BE REQUIRED, PLEASE CONTACT:

THE TECHNICAL MATERIEL CORP., 700 Fenimore Road, Mamaroneck, New York

Attn.: Direct r f Eng. Services.

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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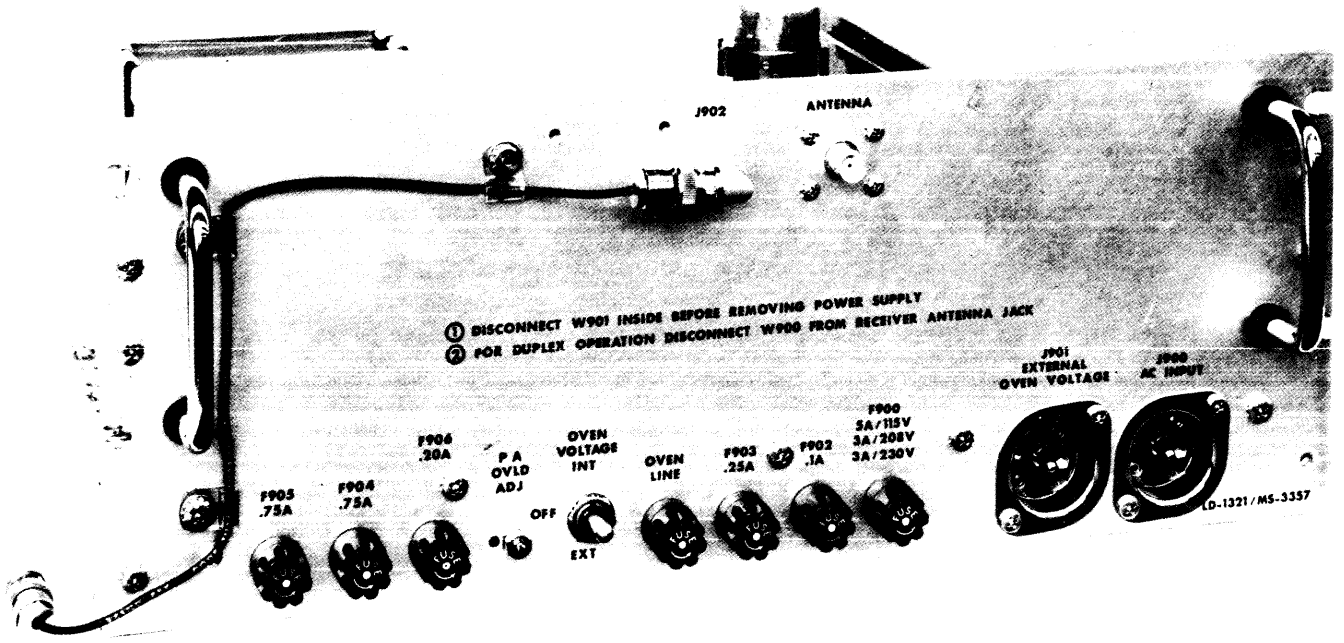


Figure 1-1. Power Supply, Model TPSA

SECTION 1

GENERAL INFORMATION

1-1. DESCRIPTION.

Power Supply, Model TPSA-1 (figure 1-1) is a solid-state power supply designed to plug into TMC transmitter/receivers (such as the TTR-10) that do not have built-in power supplies. The TPSA provides all operating voltages required by the associated transmitter/receiver as well as antenna switching for simplex operation of the associated transmitter/receiver. The TPSA contains: (1) a low-voltage power supply for operation of receiver and exciter circuits; (2) a filament, bias, and high-voltage power supply for operation of linear-amplifier circuits; (3) an antenna switching relay.

Most of the smaller components in the TPSA are located on a printed-circuit board that is mounted to the chassis; larger components are chassis mounted. Figures 5-1 and 5-2 show the inside of the unit. All TPSA outputs are available at a connector (J903) mounted on the rear of the unit. The front panel contains jacks for connecting the TPSA to a primary-power source, to external oven power supplies, and for antenna input and output connections. All fuses for the TPSA are mounted on the front panel.

Performance specifications and other reference data (physical dimensions, weight, etc.) are given in paragraph 1-2. The semiconductor complement of the TPSA is given in table 1-1.

TABLE 1-1. SEMICONDUCTOR COMPLEMENT

REFERENCE DESIGNATION	TYPE	FUNCTION
CR901 through CR904	1N547	Rectifiers
CR905 through CR908	1N3006RB	Zenner regulators
CR909		Bridge rectifier
CR910 and CR911	1N547	Rectifiers
CR912	1N3022B	Voltage reference
CR913 and CR914	1N547	Rectifiers
CR915	1N3022B	Voltage reference
CR916 and CR917	1N547	Rectifiers
CR918	1N3033B	Voltage reference
Q900	2N350A	+12 V series regulator
Q901	2N350	-12 V series regulator
Q902	2N350A	-36 V series regulator

1-2. TECHNICAL SPECIFICATIONS.

Primary power input	104/115/208/230 volts, 50 - 400 cps single-phase a-c.
Oven power input	Depends upon the type of ovens used in the equipment of which the TPSA is a part.
Outputs	
1. Regulated	+12, -12, -36, -105, and +315 V.
2. Unregulated	+400, +800 V, and -150 V.
3. Oven voltage	Same as primary-power input when OVEN VOLTAGE switch is set at INT. Same as oven-power input when OVEN VOLTAGE switch is set at EXT.
4. Filament voltage	6.3 VAC.
Dimensions	Depth: 6.0 inches Width: 16.5 inches Height: 6.25 inches.
Weight, uncrated	40 pounds.

SECTION 2

INSTALLATION

2-1. INITIAL INSPECTION.

Each TPSA has been thoroughly checked and tested at the factory before shipment. When it arrives at the operating site, inspect the packing case and its contents immediately for possible damage. Unpack the equipment carefully; inspect all packing material for parts that 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. POWER REQUIREMENT.

a. MAIN POWER. - The TPSA can operate with 104, 115, 208, or 230 volts a-c power; it is factory wired for 115 volts a-c unless otherwise specified on customer's order. Minor wiring changes must be made to power transformers T900 and T901 (see figure 2-1) if the TPSA is to be operated from a power source other than that for which it was originally configured. It is recommended that a 5-ampere fuse (F900) be used with 104 or 115 volts, and a 3 ampere fuse be used with 208 or 230 volts.

b. OVEN POWER. - When OVEN VOLTAGE switch S900 is set at INT, primary-power input voltage is available for crystal ovens in the unit that is powered by the TPSA. If a voltage other than the primary input-voltage is required, an external oven supply must be provided. This supply must be connected to EXTERNAL OVEN VOLTAGE jack J901, and the OVEN VOLTAGE switch must be set at EXT; if no oven-supply voltage is required, the OVEN VOLTAGE switch should be set at OFF. The value of OVEN LINE fuse F901 depends upon the number of crystal ovens in use and upon the oven supply voltage.

2-3. INSTALLATION REQUIREMENTS.

Installation procedures for the TPSA are included in the manual for the unit in which the TPSA is used.

2-4. PERFORMANCE CHECK.

Proper operation of the TPSA is verified by satisfactory completion of the performance check for the unit in which the TPSA is used.

NOTE

PA OVLD ADJ R907 must be set at the time of installation according to the procedure given in the manual for the unit in which the TPSA is used.

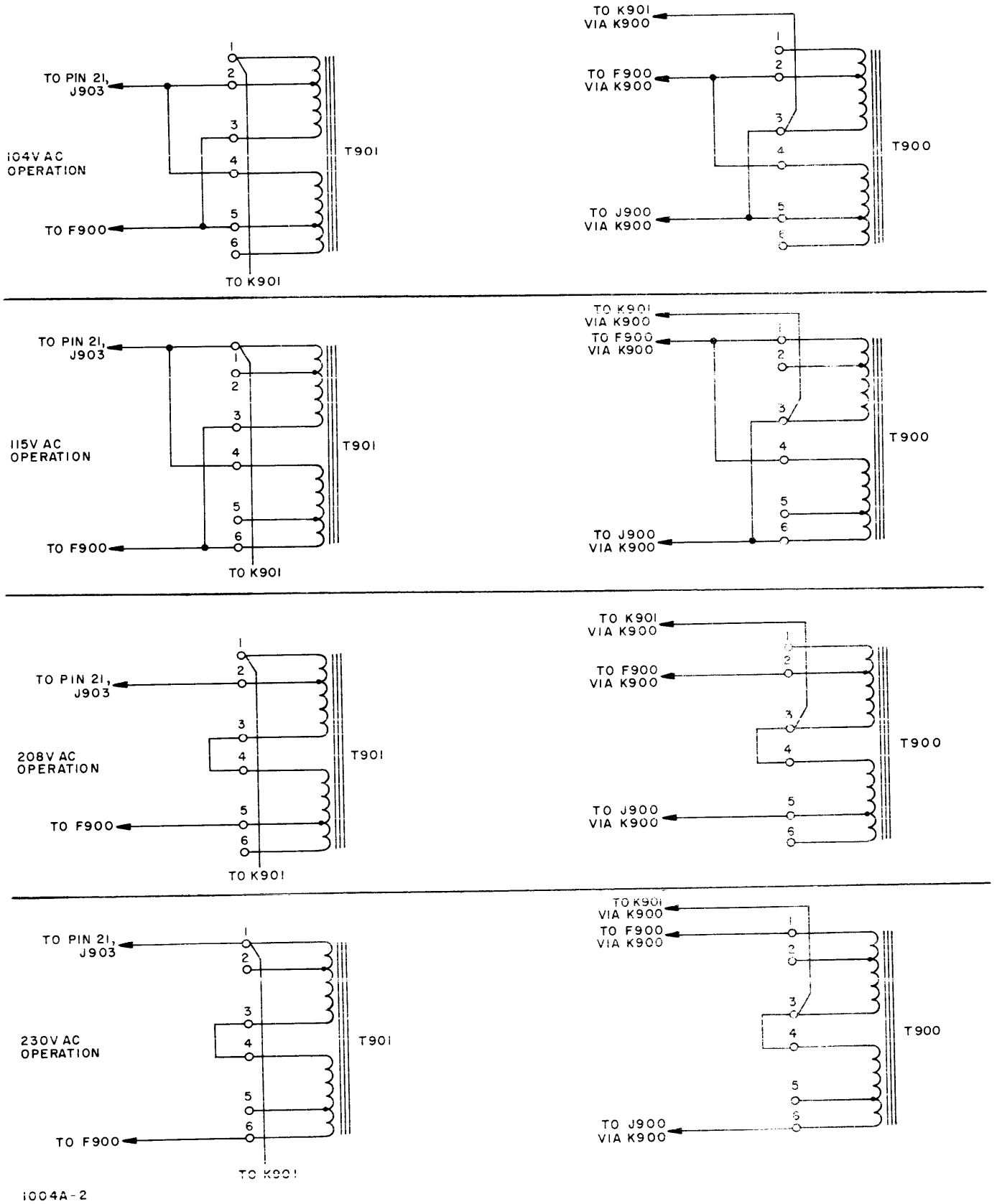


Figure 2-1. Power Transformer Wiring

SECTION 3

OPERATOR'S SECTION

The TPSA has one operator's control: the OVEN VOLTAGE switch (see figure 1-1). If the ovens in the transmitter/receiver (of which the TPSA is a part) are to be operated from the same primary power source as the power supply, set OVEN VOLTAGE switch at INT. If the ovens in the transmitter/receiver are to be operated from a separate power source (connected to EXTERNAL OVEN VOLTAGE jack J901), set the switch at EXT. If no oven-supply voltage is required, set the switch at OFF.

SECTION 4

PRINCIPLES OF OPERATION

4-1. GENERAL.

The TPSA, designed for use with TMC transmitter/receivers that do not have built-in power supplies, produces all operating voltages required by the associated transmitter/receiver, and also provides antenna switching for the transmitter/receiver when it is used in simplex operation. Circuit analyses for the four circuits that constitute the TPSA are given in paragraphs 4-2a through 4-2d.

4-2. CIRCUIT ANALYSES. (See figure 7-1.)

a. OVEN SUPPLY. - The oven supply provides operating voltage for crystal ovens contained in the r-f stages of the unit that the TPSA powers. The oven-supply voltage is applied across pins 23 and 24 of J903 through OVEN VOLTAGE switch S900. If the ovens used in the associated transmitter/receiver require the same voltage as the a-c input to the TPSA, S900 is set at INT. For other oven-voltage requirements, S900 is set at EXT and the oven voltage is provided by an external source connected to EXTERNAL OVEN VOLTAGE jack J901. If ovens are not used, S900 is set at OFF. The external oven supply is fused in the TPSA.

b. LOW-VOLTAGE POWER SUPPLY. - The low-voltage power supply consists of three independent, separately-fused regulated supplies: a +12 vdc supply, a -12 vdc supply, and a -36 vdc supply. Each supply contains a series-regulating transistor in which the output voltage (at the emitter) is compared to a stable zener-diode reference voltage (at the base). The conduction in the series regulator varies as its emitter voltage changes, and thus, a constant output voltage is maintained. The +12 vdc and -12 vdc supplies are identical, and are very similar to the -36 vdc supply.

The a-c power for the low-voltage power supply is provided by step-down transformer T901, which can be wired for operation with 104 vac, 115 vac, 208 vac, or 230 vac. Power from AC INPUT jack J900 is supplied to the low-voltage power supply whenever pins 20 and 21 of J903 are connected togehter; this connection is made by the power switch of the transmitter/receiver in which the TPSA is used. Operating voltage for a pilot lamp in the associated transmitter/receiver is applied across pins 16 and 17 of J903 whenever the low-voltage power supply is energized.

c. HIGH-VOLTAGE POWER SUPPLY. - The high-voltage power supply consists of a +800 vdc unregulated supply, a +400 vdc unregulated supply, a +315 vdc zener-diode regulated supply, and a -150 vdc unregulated and a -105 vdc zener-diode regulated supply. Each supply, except the +800 vdc supply, is separately fused; the +800 vdc supply is protected by a circuit breaker in the associated transmitter/receiver, whose trip point is determined by the setting of PA OVLD ADJ R907. In addition, the high-voltage supply provides a 6.3 vac output. All of the outputs of the high-voltage supply are used for the operation of the linear amplifier in the transmitter section of the unit in which the TPSA is installed.

Both the +800 vdc and +400 vdc unregulated supplies receive their a-c voltage from winding 9-10-11 of T900. The +800 vdc supply is derived by the a-c voltage developed across the entire winding; this a-c voltage is full-wave rectified by bridge rectifier CR909. The +400 vdc supply is derived by the a-c voltage developed across either winding 9-10 or 10-11 depending upon the instantaneous polarity of the induced voltage. This a-c voltage

is full-wave rectified by two of the four diodes in CR909. Thus, two of the four diodes are shared by both the +800 vdc and +400 vdc supplies, while the other two are part of the +800 vdc supply only.

The a-c power for the high-voltage power supply is provided by transformer T900, which can be wired for operation with 104 vac, 115 vac, 208 vac, or 230 vac. Power from AC INPUT jack J900 is supplied to the high-voltage power supply whenever h-v control relay K900 is energized. Relay K900 is energized by +12 vdc from the low-voltage power supply when pin 5 of J903 is grounded through the interlock circuit in the associated transmitter.

d. ANTENNA SWITCHING CIRCUIT. - Antenna relay K901 provides antenna switching for simplex operation of the transmitter/receiver in which the TPSA is used. In simplex operation, the output of the transmitter section is connected through W901 to P900; the input to the receiver section is connected from P901 through W902, and the antenna is connected to the ANTENNA jack. When K901 is deenergized, the antenna is connected to the receiver section input, and the output of the transmitter section is grounded. When K901 is energized, the antenna is connected to the transmitter section output, and the input to the receiver section is grounded. In duplex operation, W902 is disconnected from K901 and a separate receiving antenna is used. The transmitter section output remains connected through the antenna relay, however.

Operate power for the antenna relay is supplied through normally open contacts of h-v control relay K900, and contacts of a transmit/receive relay in the associated transmitter/receiver. The antenna relay is energized only when the transmitter section is ready for operation and the transmitter is keyed.

SECTION 5

MAINTENANCE

5-1. PREVENTIVE MAINTENANCE.

Preventive maintenance of the TPSA consists of routine visual inspection and cleaning. Cleaning is necessary because dust may accumulate on certain components and not only reduce the efficiency of the unit, but also increase component wear. Either a vacuum cleaner or a compressed air hose is the quickest and most effective method of cleaning the unit. Visually checking the TPSA at the time of cleaning can prevent downtime due to component failure. Often a deteriorating component will look bad before it actually affects the operation of the unit. Some indications of trouble are: discolored components, leaking capacitors, dirty switch and relay contacts, warped printed-circuit boards, and damaged wiring. Any components found in this condition should be replaced. In addition, all hardware should be checked for tightness.

5-2. TROUBLESHOOTING.

The first step in troubleshooting the TPSA is to ascertain which of the supplies (oven supply, low-voltage power supply, or high-voltage power supply) is not operating properly. Check the fuse for each supply before proceeding with any extensive troubleshooting. If the problem is not a blown fuse, remove the TPSA from the associated transmitter/receiver, and bench test the unit.

NOTE

The TPSA must be connected to its associated transmitter/receiver when making voltage measurements so that the on/off control circuits may function.

The following are the voltage measurements for the regulating transistors in the low-voltage power supply. All of the readings were taken with respect to ground.

TRANSISTOR NO.	BASE	EMITTER	COLLECTOR
Q900	0	0	+13
Q901	-12	-12	-25
Q902	-36	-36	-65 V

5-3. REPAIR.

In most cases, the repair of the TPSA will consist of the replacement of an electrical component. Although no special instructions are required to accomplish this, the following hints are provided to ensure that the repairs are completed properly.

a. Always replace a defective component with its exact duplicate.

b. Always place a new component in the same position as the one it replaces. In general, never change the existing chassis layout, whether in the routing of wiring or component placement.

c. Never use a soldering iron with a power rating of more than 100 watts. Use a pair of long-nose pliers as a heat sink to protect components while soldering.

d. Be extremely careful when replacing components on printed circuit boards. Excessive heat applied to a board might damage the printed wiring.

e. Double check any solder joints made. Cold or loose solder connections can cause trouble at a later time.

5-4. ALIGNMENT.

The TPSA has only one adjustment, PA OVLD ADJ R907. This adjustment must be set for correct operation of the unit in which the TPSA is used, and must be made when the TPSA is installed in that unit. The adjustment of the PA OVLD ADJ is described in the manual for the unit in which the TPSA is used.

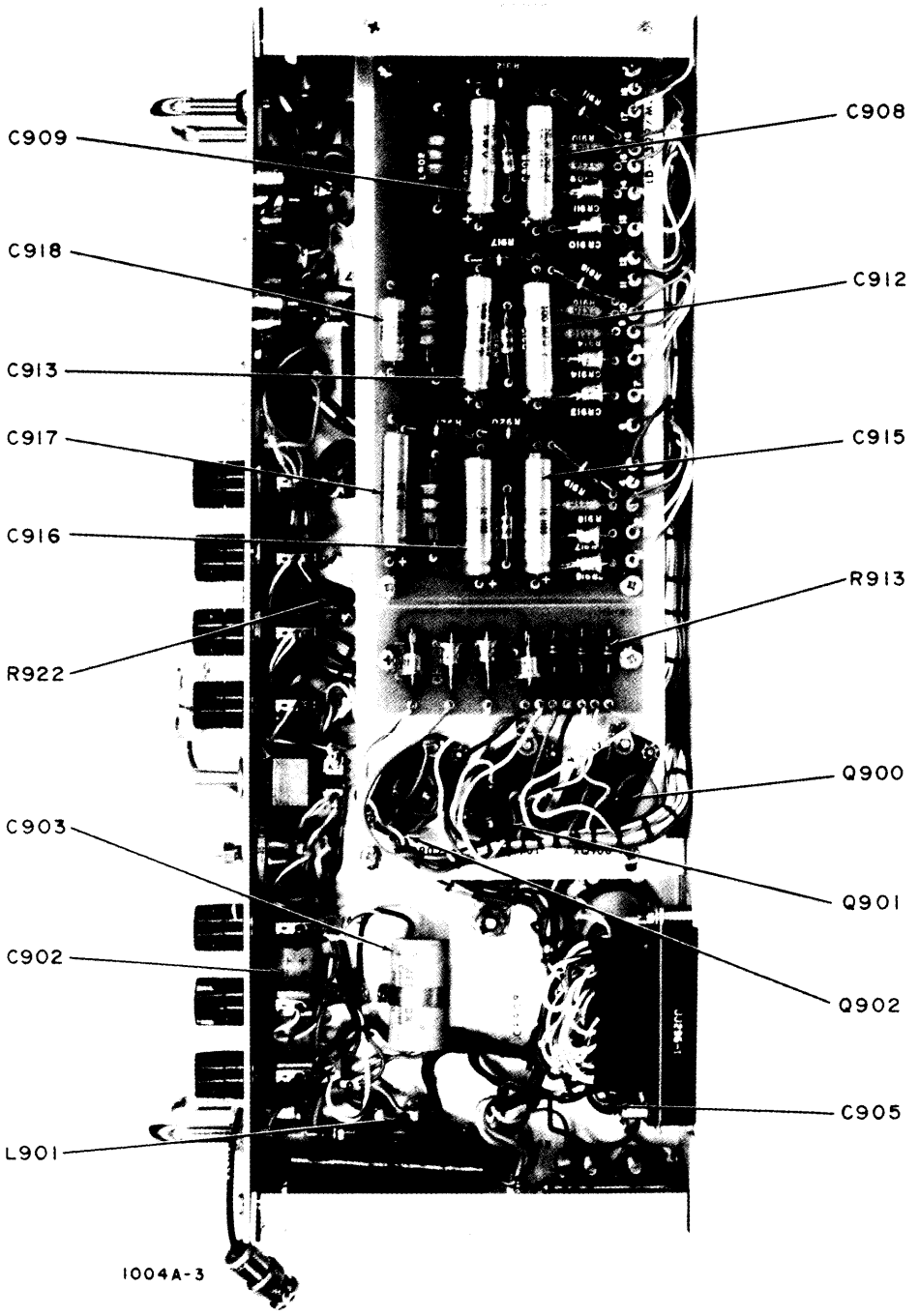


Figure 5-1. TPSA, Bottom View

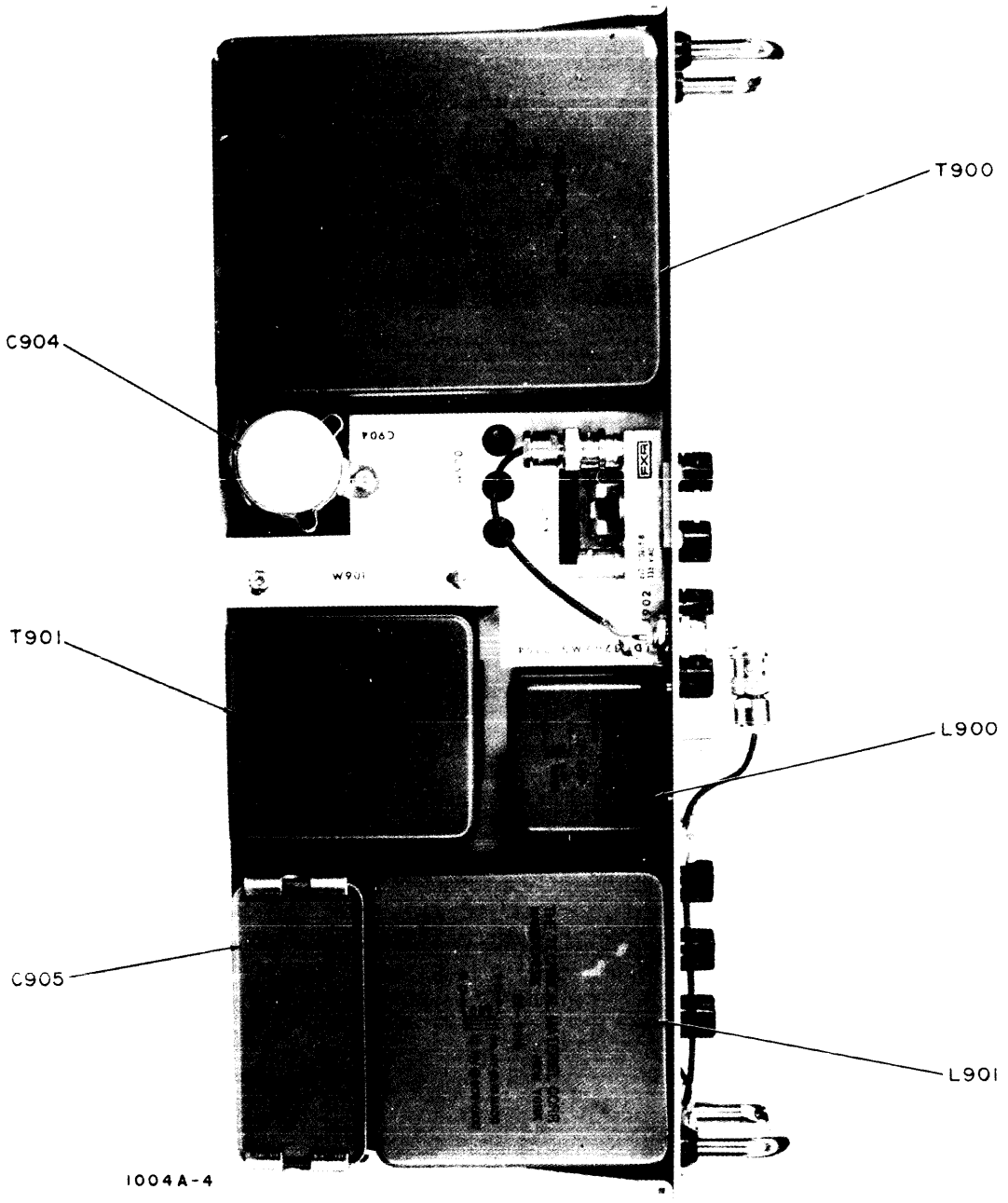


Figure 5-2. TPSA, Top View

SECTION 6

PARTS LIST

Reference designations have been assigned to identify all electrical parts of the equipment. These designations are used for marking the equipment (adjacent to the part they identify) and are included on drawings, diagrams and the parts list. The letters of a reference designation indicate the kind of part (generic group), such as resistor, capacitor, transistor, etc. The number differentiates between parts of the same generic group. Sockets associated with a particular plug-in device, such as transistor or fuse, are identified by a reference designation which includes the reference designation of the plug-in device. For example, the socket for fuse F900 is designated XF900. To expedite delivery, when ordering replacement parts, specify the TMC part number and the model number of the equipment.

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C900A, B	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2 x 10,000 uuf, GMV; 1,000 WVDC.	CC100-23
C901A, B	Same as C900A, B.	
C902	CAPACITOR, FIXED, ELECTROLYTIC: 20 uf; 250 WVDC; polarized; tubular case.	CE103-5
C903	Same as C902.	
C904	CAPACITOR, FIXED, ELECTROLYTIC: 80 uuf; 450 WVDC; polarized; aluminum case.	CE51F800R
C905	CAPACITOR, FIXED, PAPER DIELECTRIC: 10.0 uf, $\pm$10%; 1,000 WVDC at 40°C; char. F.	CP115-1
C906	NOT USED	
C907	CAPACITOR, FIXED, ELECTROLYTIC: 2,000 uf, 25 WVDC; polarized; hermetically sealed aluminum case with clear vinyl plastic sleeve.	CE116-5VN
C908	CAPACITOR, FIXED, ELECTROLYTIC: 100 uf, -10% +150% at 120 cps at 25°C; 25 WVDC; polarized; insulated tubular case.	CE105-100-25
C909	Same as C908.	
C910	Same as C907.	
C911	Same as C907.	
C912	Same as C908.	
C913	Same as C908.	
C914	CAPACITOR, FIXED, ELECTROLYTIC: 100 uuf; 100 WVDC; polarized; aluminum case.	CE51C101H
C915	CAPACITOR, FIXED, ELECTROLYTIC: 20 uf, -10% +150% at 120 cps at 25°C; 100 WVDC; polarized; insulated tubular case.	CE105-20-100
C916	Same as C915.	
C917	Same as C915.	
C918	CAPACITOR, FIXED, ELECTROLYTIC: 25 uf, -10% +150% at 120 cps at 25°C; 50 WVDC; polarized; insulated tubular case.	CE105-25-50
CP900	ADAPTER, CONNECTOR, ELECTRICAL: RF type; right angle, one male, one female coaxial contact; series BNC to BNC.	UG306B/U
CR900	NOT USED	
CR901	SEMICONDUCTOR DEVICE, DIODE: silicon; 600 V max. peak inverse voltage; 0.75 max. DC forward amperes at 150°C.	1N547
CR902 thru CR904	Same as CR901.	

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
CR905	SEMICONDUCTOR DEVICE, DIODE: Zener, silicon; 105 volts, 10 watts, non-inductive; cathode grounded to case.	1N3006RB
CR906 thru CR908	Same as CR905.	
CR909	SEMICONDUCTOR DEVICE, DIODE: silicon; peak reverse voltage 3,000 V; max. V RMS 2,100 volts; max. DC output voltage 1,890 volts; max. DC current output 500 ma; max. forward voltage drop 6 V; re-current peak current 3 amps; max. reverse current 10 ua; operating temperature range -55°C to +125°C; hermetically sealed.	DD108-1
CR910	Same as CR901.	
CR911	Same as CR901.	
CR912	SEMICONDUCTOR DEVICE, DIODE: silicon; nom. ref. voltage 12 volts; max. dissipation 1 watt at 25°C; current rating 21 ma; max. impedance 9 ohms; hermetically sealed metal case.	1N3022B
CR913	Same as CR901.	
CR914	Same as CR901.	
CR915	Same as CR912.	
CR916	Same as CR901.	
CR917	Same as CR901.	
CR918	SEMICONDUCTOR DEVICE, DIODE: Zener; nom. voltage 36 volts; current rating 7.0 ma; max. impedance 50 to 100 ohms, 0.25 ma; max. reverse current 5 ua; max. DC current 24 ma; junction-storage temperature range -65°C to +175°C; hermetically sealed metal and glass welded case.	1N3033B
F900	FUSE, CARTRIDGE: 3 amps, 250 volts; medium time lag; 1-1/4" lg. x 1/4" dia.; hi-rating. (FOR 208/230 VAC OPERATION)	FU103-3
F900	FUSE, CARTRIDGE: 5 amps, 250 volts; medium time lag; 1-1/4" lg. x 1/4" dia.; hi-rating. (FOR 115 VAC OPERATION)	FU103-5
F901	FUSE, CARTRIDGE: 1/8 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow. (USED WITH 2 OVENS)	FU102-.125
F901	FUSE, CARTRIDGE: 1/4 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow. (USED WITH 4 OVENS)	FU102-.250
F901	FUSE, CARTRIDGE: 3/8 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow. (USED WITH 6 OVENS)	FU102-.375
F901	FUSE, CARTRIDGE: 1/2 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow. (USED WITH 8 OVENS)	FU102-.5
F902	FUSE, CARTRIDGE: 1/10 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow.	FU102-.1
F903	FUSE, CARTRIDGE: 1/4 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow.	FU102-.250

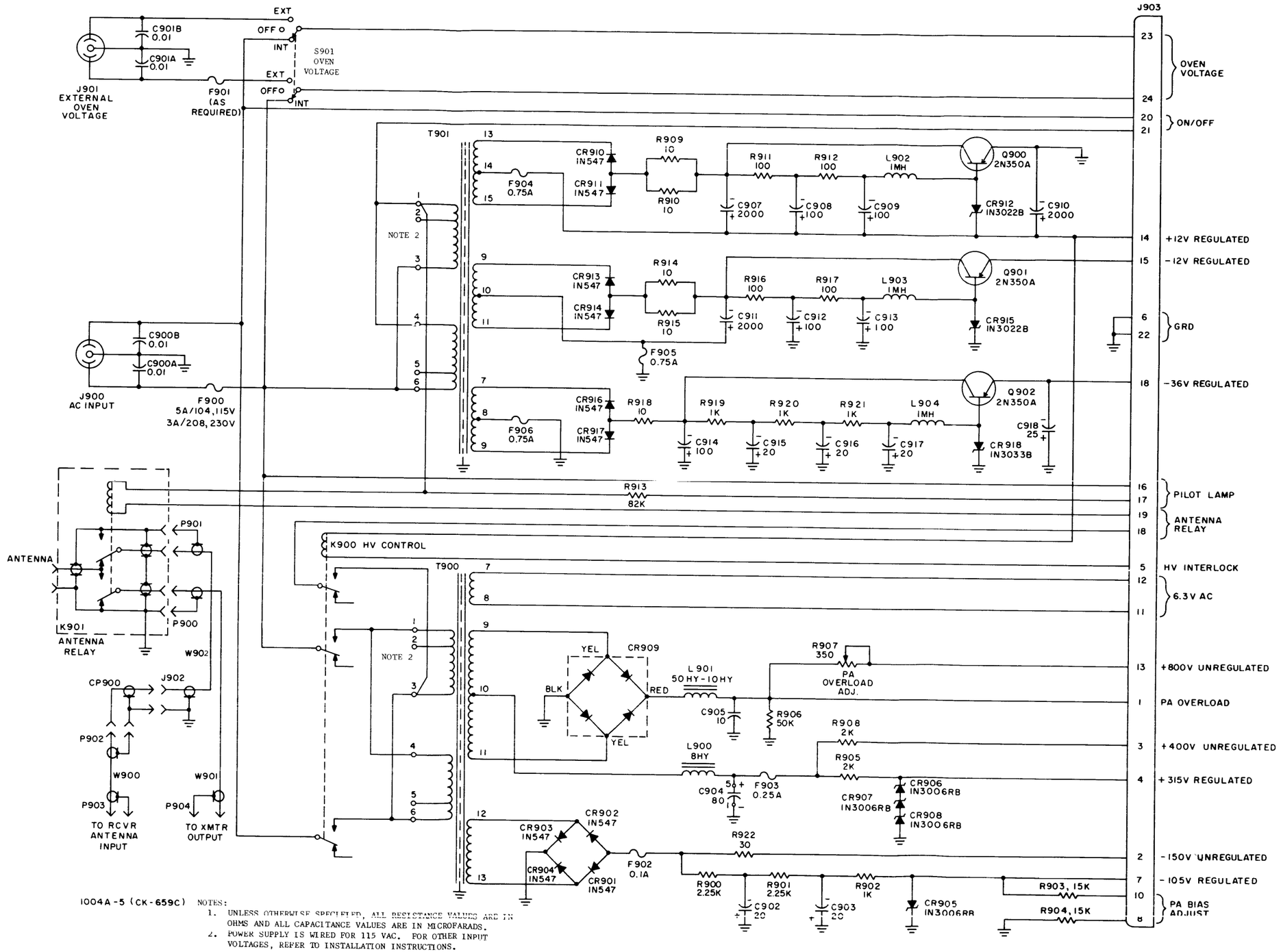
REF SYMBOL	DESCRIPTION	TMC PART NUMBER
F904	FUSE, CARTRIDGE: 3/4 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow.	FU102-.750
F905	Same as F904.	
F906	FUSE, CARTRIDGE: 2/10 amp; time lag; 1-1/4" lg. x 1/4" dia.; slow blow.	FU102-.2
J900	CONNECTOR, RECEPTACLE, ELECTRICAL: male; AC power; 2 contacts; 250 V at 10 amps, 125 V at 15 amps; polarized; twist lock.	JJ175
J901	Same as J900.	
J902	CONNECTOR, RECEPTACLE, ELECTRICAL: RF; 1 round female contact; straight type; 52 ohms; series BNC to BNC.	UG625B/U
J903	CONNECTOR, RECEPTACLE, ELECTRICAL: 24 flat female contacts, rated at 5 amps, 750 WVDC; polarized. Part of W903.	JJ295-1
K900	RELAY, ARMATURE: 3PDT; 11 terminals; contacts rated at 10 amps, 115 VAC non-inductive; 120 ohms, ±10% DC resistance; operating voltage 12 VDC; operating current 100 ma; nom. power 1.2 watts.	RL144-2
K901	RELAY, ARMATURE, COAXIAL: 550 ohms, ±10% DC resistance; operating voltage 115 VAC; coil pull-in voltage 93 VAC, coil drop-out voltage 10 VAC; contacts rated for 100 watts RF at 50 ohms impedance; 3 BNC connector type terminals; silver plated brass case.	RL157-1
L900	REACTOR: inductance, 8 hy at 160 ma DC at 120 cps; max. DC current 160 ma; 180 ohms nom. DC resistance; hermetically sealed rectangular steel case.	TF5017
L901	REACTOR: 50 hy at 15 ma DC and 10 hy at 200 ma DC; hermetically sealed steel case.	TF5018
L902	COIL, RADIO FREQUENCY: fixed; 3 PI; 1 mh inductance; 23 ohms, ±10% resistance; current rating 75-100 ma max.	CL101-2
L903	Same as L902.	
L904	Same as L902.	
P900	CONNECTOR, PLUG, ELECTRICAL: crimp type; 1 male pin type contact; 500 V peak, 50 ohms; polarized; twist lock; BNC type. Part of W901.	PL244-1
P901	Same as P900. Part of W902.	
P902	Same as P900. Part of W900.	
P903	Same as P900. Part of W900.	
P904	Same as P900. Part of W901.	
Q900	TRANSISTOR: germanium; base voltage 50 V; emitter voltage 40 V; dissipation 90 watts at 25°C; normal operating temperature range -65°C to +100°C; load resistance 2.2 ohms, collector current 3 amps, base current 013 amps; 1.56" lg. x 1.05" wide x .32" high; male plug-in type.	2N350A

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
Q901	Same as Q900.	
Q902	Same as Q900.	
R900	RESISTOR, FIXED, WIREWOUND: 2,250 ohms; current rating 47 ma; 5 watts.	RW107-41
R901	Same as R900.	
R902	RESISTOR, FIXED, WIREWOUND: 1,000 ohms; current rating 100 ma; 10 watts.	RW109-24
R903	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±5%; 1/2 watt.	RC20GF153J
R904	Same as R903.	
R905	RESISTOR, FIXED, WIREWOUND: 2,000 ohms; current rating 110 ma; 25 watts.	RW111-24
R906	RESISTOR, FIXED, WIREWOUND: 50,000 ohms; current rating 8 ma; 25 watts.	RW111-40
R907	RESISTOR, VARIABLE, WIREWOUND: 350 ohms, ±10%; 12.5 watts; linear taper A.	RP100XH351K
R908	RESISTOR, FIXED, WIREWOUND: 2,000 ohms; current rating 70 ma; 10 watts.	RW109-28
R909	RESISTOR, FIXED, WIREWOUND: 10 ohms, ±5%; 3 watts.	RW123-100J
R910	Same as R909.	
R911	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±10%; 1 watt.	RC32GF101K
R912	Same as R911.	
R913	RESISTOR, FIXED, COMPOSITION: 82,000 ohms, ±10%; 1/2 watt.	RC20GF823K
R914	Same as R909.	
R915	Same as R909.	
R916	Same as R911.	
R917	Same as R911.	
R918	Same as R909.	
R919	RESISTOR, FIXED, COMPOSITION: 1,000 ohms, ±10%; 1 watt.	RC32GF102K
R920	Same as R919.	
R921	Same as R919.	
R922	RESISTOR, FIXED, WIREWOUND: 30 ohms, ±5%; current rating 408 ma; 5 watts.	RW107-13
S900	SWITCH, TOGGLE: DPDT; rated for 6 amps at 115 VAC; 6 screw type terminals.	ST50P

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
T900	TRANSFORMER, POWER, STEP-DOWN, STEP-UP: primary input voltage 115, 208, 230 V, 50 to 400 cps, 1 phase; secondary (#1) 63 VAC at 30 maps, (#2) 930 V, CT at 200 ma, (#3) 180 VAC; solder lug type terminals; hermetically sealed steel case.	TF265
T901	TRANSFORMER, POWER, STEP-DOWN: primary input voltage 115, 208, 230 V, 50 to 400 cps, 1 phase; secondary (#1) 250 ma DC, 100 V, CT, (#2) 500 ma DC, 38 V, CT, (#3) 500 ma DC, 38 V, CT; solder lug type terminals; hermetically sealed steel case.	TF264
W900	CABLE ASSEMBLY, ELECTRICAL: RF; 14" length RG174/U coaxial cable; two cable connectors, P902, P903.	CA480-3-14
W901	CABLE ASSEMBLY, ELECTRICAL: RF; 5" length RG174/U coaxial cable; two cable connectors, P900, P904.	CA480-3-5
W902	CABLE ASSEMBLY, ELECTRICAL: RF; 5" length RG174/U coaxial cable; one cable connector, P901.	CA480-96-5
W903	WIRING HARNESS, BRANCHED, ELECTRICAL: consists of various lengths and colors of MWC wire, rubber covered; insulation sleeving; terminal lugs; one cable connector, J903.	CA789
XC900 thru XC903	NOT USED	
XC904	SOCKET, ELECTRON TUBE: saddle type, 8 contacts, phosphor bronze or beryllium copper plated with tin, hot solder dipped; low crown; 2 mounting holes, 0.156" dia.; molded thermosetting plastic insulator body.	TS165P01
XC905 thru XC913	NOT USED	
XC914	Same as XC904.	
XF900	FUSEHOLDER: extractor post type; accommodates cartridge fuse 1-1/4" lg. x 1/4" dia.; rated at 15 amps, 250 V max.; o/a length 1-3/4"; bushing mounted.	FH103
XF901 thru XF906	Same as XF900.	
XQ900	SOCKET, SEMICONDUCTOR DEVICE: 2 pin contact accommodation, 0.040 or 0.050 dia.; polarized; 1 terminal lug grounding strap; o/a dimensions 1-37/64" x 1" max.	TS166-1
XQ901	Same as XQ900.	
XQ902	Same as XQ900.	

SECTION 7

SCHEMATIC DIAGRAMS



1004A-5 (CK-659C) NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE VALUES ARE IN OHMS AND ALL CAPACITANCE VALUES ARE IN MICROFARADS.
2. POWER SUPPLY IS WIRED FOR 115 VAC. FOR OTHER INPUT VOLTAGES, REFER TO INSTALLATION INSTRUCTIONS.

Figure 7-1. TPSA, Schematic Diagram