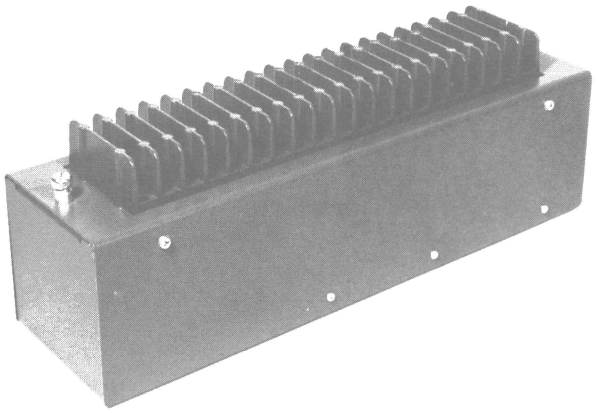
MOBILE RADIO

# POWR MASTR

## 150.8 - 174 MHz, 60 WATT VEHICULAR POWER AMPLIFIER TYPE KT-183-A





## SPECIFICATIONS *

| | |
|---|---|
| Dimensions (H x W x D) | 5.2" x 14.5" x 4"<br>(13.2 cm x 36.8 cm x 10.1 cm) |
| Weight | 8 pounds<br>(3.63 Kilograms) |
| DC Input Voltage | 13.6 VDC |
| RF Drive | 1 to 6 Watts |
| Current Drain | |
| Standby | 40 Milliamps |
| Transmit | 13.5 Amps (rated power) |
| Temperature Range | -30°C to 60°C |
| Receiver Insertion Loss | 0.75 dB |
| Spurious | |
| Radiated | -60 dB |
| Conducted | -60 dB |

VEHICULAR POWER AMPLIFIER KT183A

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

GENERAL ELECTRIC

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# COMBINATION NOMENCLATURE

| 1, 2 Digits | 3rd Digit | 7th Digit | 5th Digit | 6th Digit | 4th Digit |
|---|---|---|---|---|---|
| Product Code | Package | Frequency Range | RF Power | Control | Power Source |
| **P3** | **A** Basic | **K** 150.8-174 MHz | **6** 41-80 Watts | **A** Standard | **G** 12 Volt DC Neg Grd |

# DESCRIPTION

General Electric POWR MASTR Vehicular Power Amplifier, Type KT-183-A is used in conjunction with the appropriate vehicular charger to increase the transmit power of a personal radio to 60 watts in the 150.8 to 174 MHz frequency range.

The vehicular power amplifier consists of a control circuit and preamplifier, and an RF power amplifier (PA). The preamplifier accommodates various input power levels of 1 - 6 watts and delivers a constant output power to drive the power amplifier. The control circuit senses the input drive from the mobile charger and controls the antenna relay and solid state switch. Both the control circuit and the preamplifier are contained on a single printed wire interface board. The printed wire interface board is mounted inside a hinged cover to provide easy access to the board for servicing. The hinged cover also provides easy access to the power amplifier, low pass filter and centralized metering jack J5.

The Vehicular Power Amplifier requires no tuning. There are only two adjustments to be made; the input level adjustment with R2 on the interface board and the power output adjust with R8 on the final power amplifier board. The input level adjust sets the drive power level required to activate the final power amplifier. The power output adjust sets the output power level.

Since no output tuning is provided, antennas must match 50 ohms within a 1.4:1 VSWR or more than 10% power loss will result. Antenna matching is important.

The PA assembly uses three RF power transistors to provide a power output of 60 watts. The output power is adjustable using power control potentiometer R8 over a range of 20 to 60 watts. A single transistor is used in the power control circuit.

Supply voltage for the PA is connected through feed-through-capacitors C297 and C298 on the side of the PA assembly. C297, C298, C299, L12 and L13 prevent RF from getting on the power leads. Diode CR295 will cause the main fuse in the fuse assembly to blow if the polarity of the power leads is reversed, providing reverse voltage protection for the amplifier.

Centralized metering jack J5 is provided for use with GE Test Set Model 4EX3A11 or Test Kit 4EX8K12. The Test Set meters the Ampl-1 drive, Ampl-1, Driver and PA current.

# CIRCUIT ANALYSIS

## INTERFACE BOARD

The interface board consists of a voltage regulator circuit, control circuit and an RF preamplifier circuit. The 13.6 VDC vehicular battery voltage is connected to J102 of the vehicular power amplifier. This DC power input is connected to both the final RF power amplifier and across H1 and G10 on the interface board. The DC voltage on H1 is applied to the collector of NPN pass transistor Q2. Zener diode VR1 controls the base of Q2 to regulate the output on the emitter to 10.5 volts. The 10.5 regulated volts powers the control circuit and the RF preamplifier.

### Control Circuit

The control circuit consist of an RF detector and switching circuit and a PIN diode RF switch. RF detector CR1 detects RF drive from the vehicular charger to operate solid state switching circuit U1 and activate the antenna relay. Level adjust R2 sets the RF level where U1 will switch (1 to 6 watts).

PIN diode RF switch, consisting of CR3, CR4 and CR5, is turned on only in the transmit mode. When on, RF is routed through the preamplifier and power amplifier to the antenna. When in the receive mode, and the switch is off, the receiver is isolated from the preamplifier. Any received signal is routed from the antenna to the vehicular charger.

The RF output of the RF switch, when in the transmit mode, is routed through thick film attenuator AT1. AT1 is used to decrease the drive to a suitable level for the preamplifier circuit.

### RF Preamplifier

The RF Preamplifier consists of RF power transistor Q1 and associated circuitry. The preamplifier amplifies the RF from attenuator AT1 to a leveled output of 250 to 450 milliwatts to drive the final power amplifier.

## POWER AMPLIFIER

The power amplifier consists of PA driver A201, PA A202 and Low Pass Filter F202.

### PA Driver (A201)

The Preamplifier output is coupled through an RF cable to PA input jack J1. The RF is coupled through a matching network to the base of Class C amplifier Q201. The network matches the 50 ohm input to the base of Q201, and consists of T1, C4 and L2. L1, R3 and C3 comprise a stabilizing network in the base circuit of Q201.

Part of the RF input is rectified by CR1 and applied to voltage divider R1 and R2. This voltage is used to meter the Ampl-1 drive at J5.

Collector voltage of Q201 (Ampl-1) is controlled by power control transistor Q215 and is applied through a collector stabilizing and feed network consisting of C6, L3, L4 and R4. The collector voltage of Q201 is metered through R7 and J5.

The output of Q201 is coupled to the base of Class C driver Q202 through a matching network consisting of L5, L6, C12, C13, C14 and R5. Collector voltage to Q202 is applied through collector stabilizing and feed network C15, L8, L11 and R6.

Collector current for Q202 is metered across tapped manganin resistor R9 at J5 (Driver Current). The reading is taken on the one-volt scale with the high sensitivity button pressed, and read as 10 amperes full scale.

The driver output is coupled through a matching network (C19, C20, C21, L9 and L10) and applied to the PA board (A202) through W217.

Capacitors C30 through C34 provide isolation for positive and negative ground operation. C22 provides DC isolation between the Driver board and the PA board.

PA Board (A202)

The driver output is coupled to the base of Class C Power Amplifier Q1 through a matching network consisting of C1 through C4, L1 and L2. L7 provides the DC return for the base of Q1. Collector voltage for Q1 is coupled through stabilizing network Z1 and collector feed network C10 and L6.

Collector current for Q1 is metered across tapped manganin resistor R10. The reading is taken on the one-volt scale with the High Sensistivity button pressed, and read as 10 amperes full scale.

Following Q1 is a matching network (C5, C6, C7, C9, L3, L4 and L5) that matches the output of Q1 to the 50 ohm input impedance of microstrip W1 on the low pass filter.

The PA output is coupled through the low pass filter to the antenna through the antenna transfer relay.

Capacitor C14 through C20 provide DC ground isolation for positive and negative ground operation. C8 provides DC isolation between the PA board and the antenna.

WARNING

The RF Power Transistors used in the Vehicular Power Amplifier contain Beryllium Oxide, a TOXIC substance. If the ceramic or other encapsulation is opened, crushed, broken or abraded, the dust may be hazardous if inhaled. Use care in replacing transistors of this type.

Power Adjust Circuit

The Power adjust circuit consists of R8 and Q215. R8 controls the base voltage and conduction of Q215. Q215 is connected in series with the collector feed network for Q201, thereby controlling the drive to Q202 and the output power. R8 is adjusted to provide the desired output power.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

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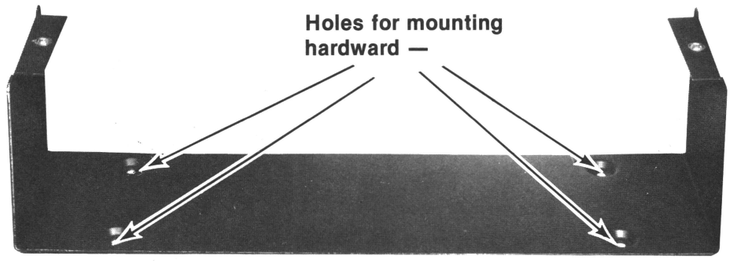
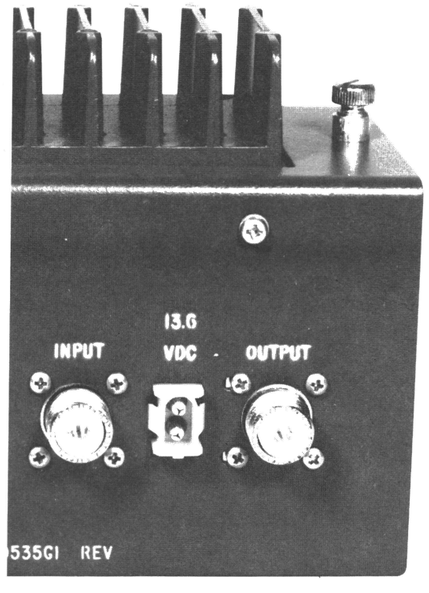
# INSTALLATION INSTRUCTIONS

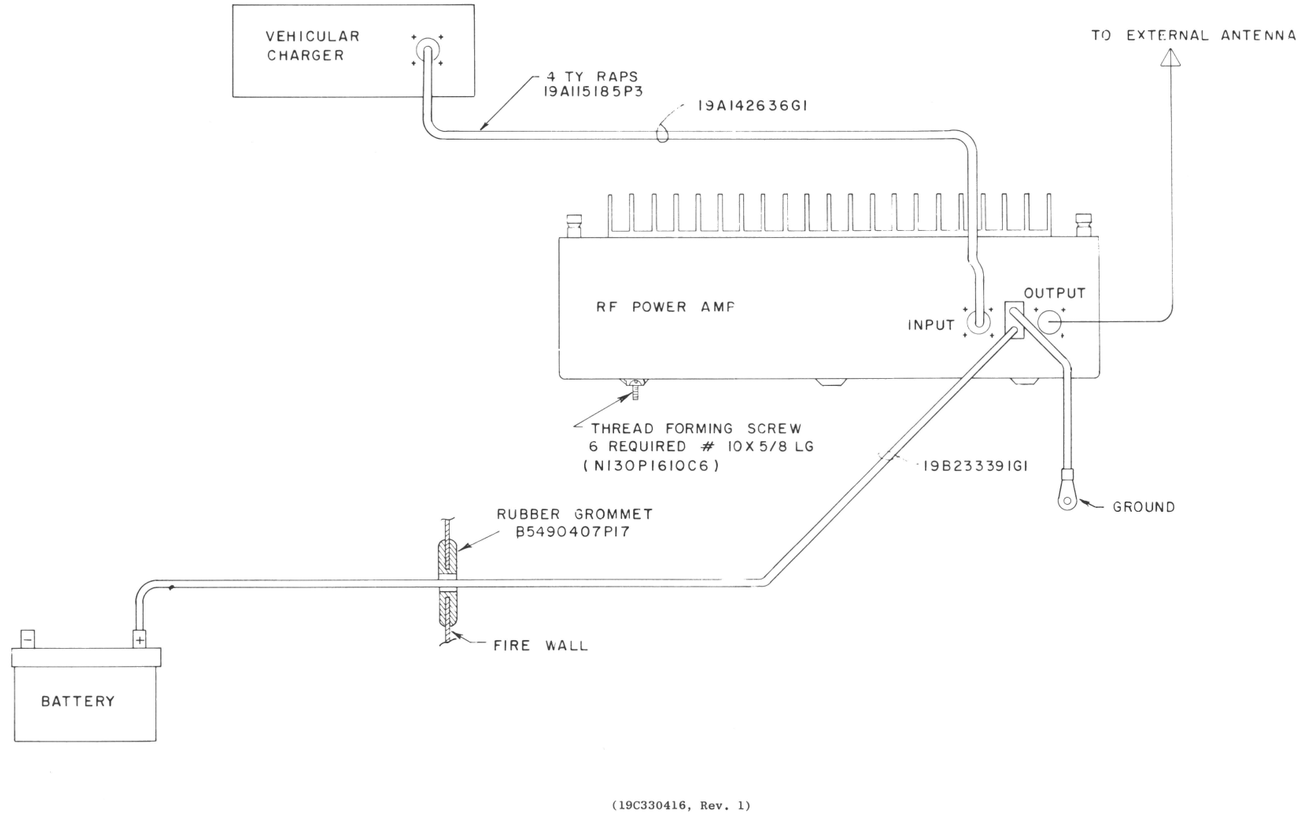
The Vehicular Power Amplifier can be mounted on any flat surface. Simply disassemble the housing as shown in the Disassembly Procedure. Use the U shaped base plate as a mounting bracket. Fasten the bracket in the desired location using the hardware shown in the installation drawing. Re-assemble the amplifier. Route and connect all cables also shown in the installation drawing.




**Base Plate Mounting Bracket**




**External Connections**

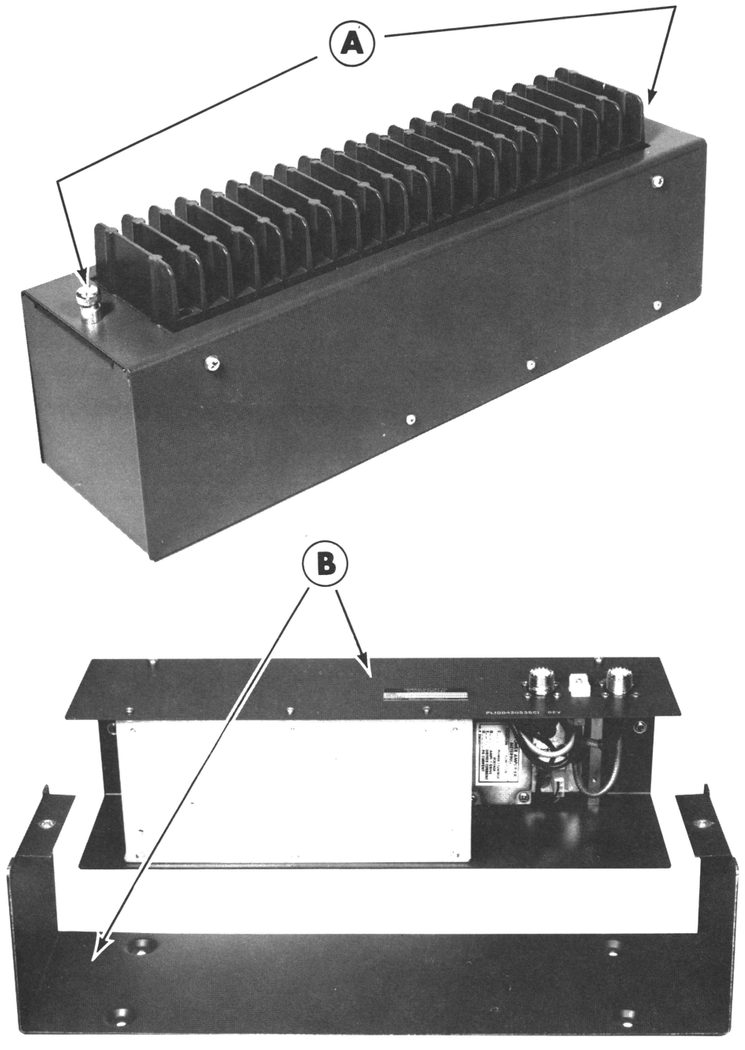



(19C330416, Rev. 1)

# DISASSEMBLY PROCEDURE

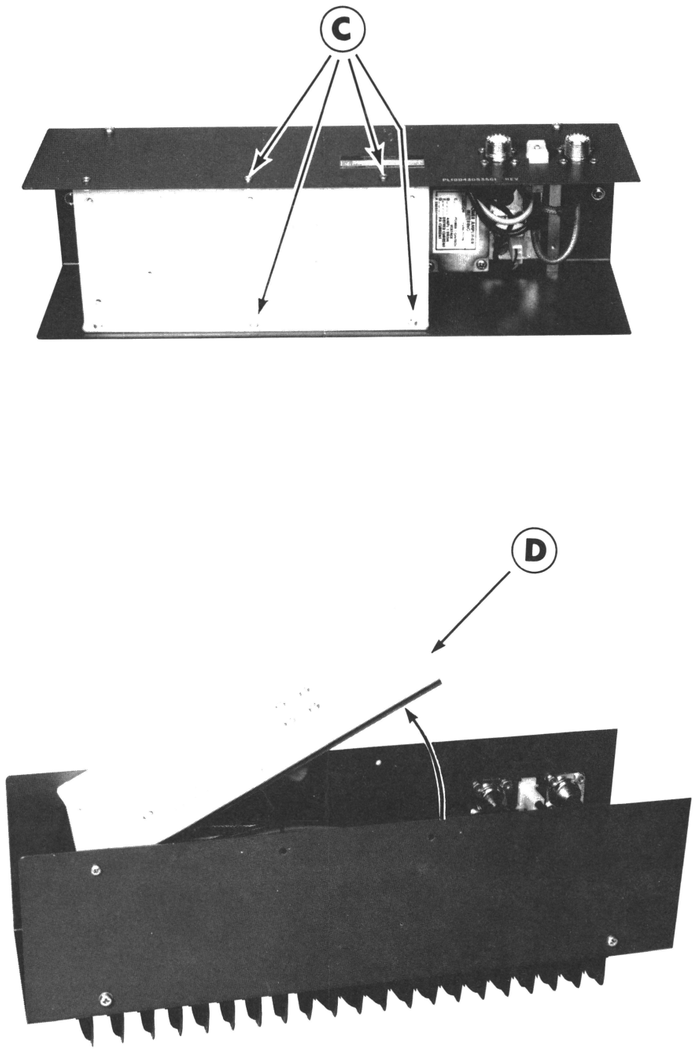
## STEP 1

To gain access to the Vehicular Power Amplifier, loosen the captive screws at Ⓐ and separate the housing as shown at Ⓑ.



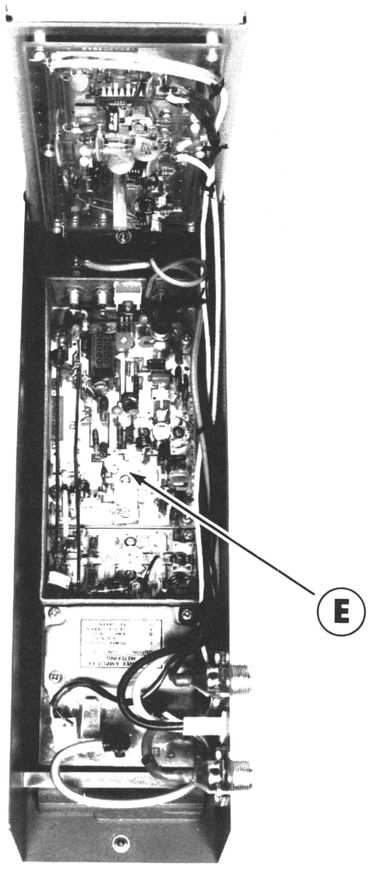

## STEP 2

To gain access to the Interface Board or the Final Power Amplifier, remove the four Phillips-Head screws at Ⓒ and swing open the cover plate as shown at Ⓓ.




## STEP 3

To gain access to the Final Power Circuitry remove the snap on cover to expose the circuitry as shown at Ⓔ.



## PA POWER INPUT

For FCC purposes, the PA power input can be determined by measuring the PA supply voltage and PA current using the following formula:

$$P_i = \text{PA voltage} \times \text{PA current}$$

where:

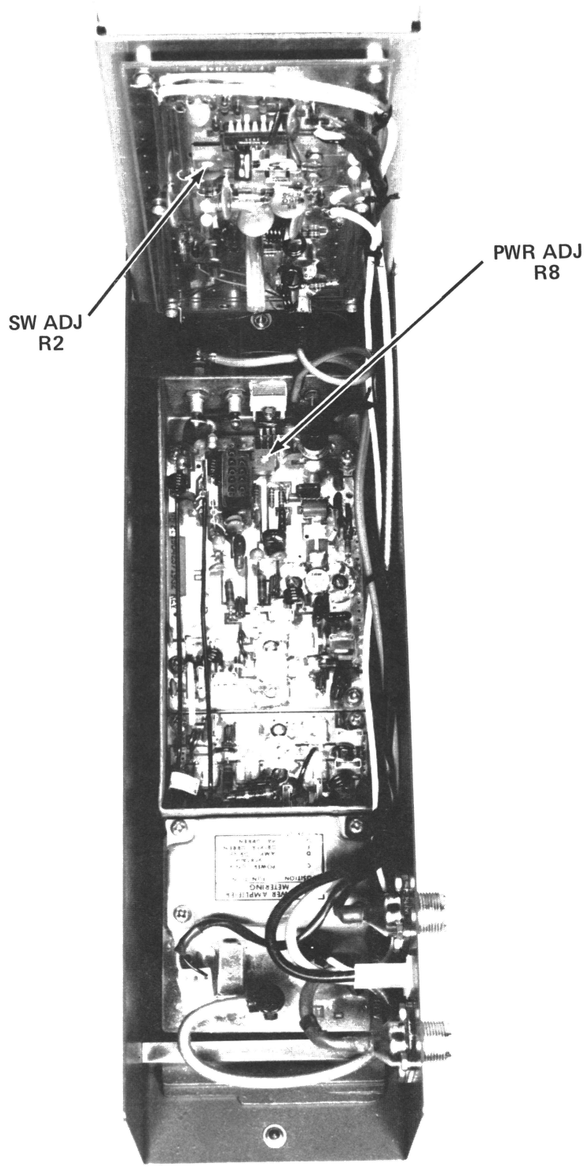
$P_i$ is the power input in watts.

PA voltage is measured according to the Note in Step 4 of the Adjustment Procedure.

PA current is measured with the Test Set in Positions G and Test 1. Read 15 amperes full scale with the HIGH SENSITIVITY button pressed.

Example:

$P_i$ = 12.6 Volts x 4.5 Amperes = 56.7 Watts




## POWER AMPLIFIER ADJUSTMENT PROCEDURE
(KT-183-A)

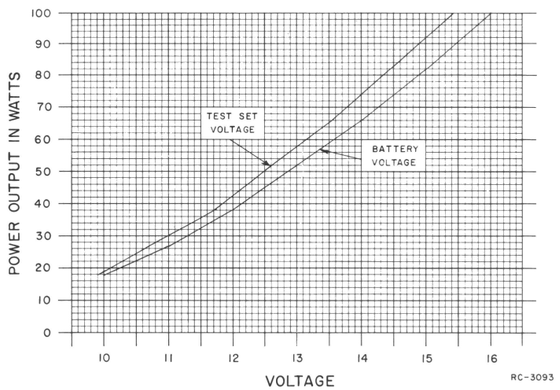
EQUIPMENT

1. GE Test Set Model 4EX3A11 or Test Kit Model 4EX8K12.
2. A 50 ohm wattmeter connected to J201.
3. An RF Signal Generator (Wavetek 2001 or equivalent) connected to J101.

PROCEDURE

| STEP | TUNING CONTROL | PROCEDURE |
|---|---|---|
| | | Interface Board |
| 1 | R2 | Set switch adjust control R2 fully clockwise. |
| 2 | -- | With the RF signal Generator, apply 0.5 Watts at 150 MHz ±1 MHz. |
| 3 | R2 | While measuring the voltage on Pin 5 of U1, adjust R2 until the voltage switches from high (≃9 VDC) to low (≃1 VDC). |
| | | Final PA |
| 4 | R8 | With the battery voltage at 13.6 Volts or the PA collector voltage at 13.0 Volts, set Power Adjust Control R8 on the PA board for desired power output.<br><br>If the battery voltage is not at 13.6 Volts or the collector voltage is not at 13 Volts and full rated power output is desired, set R8 for the output power according to the battery voltage or collector voltage shown in the following chart.<br><br>NOTE: PA voltage is measured with Test Set 4EX3A11 in position G. Read on the 15 Volt range as 15 Volts full scale with the polarity switch in the (-) position. With Test Set 4EX8K12, use the B+ position and the 1- Volt range. Read as 15 Volts full scale with the HIGH SENSITIVITY button pressed and the polarity switch in the (-) position. |

60 WATT EXECUTIVE II
POWER OUTPUT VS VOLTAGE




Power Output Setting Chart

STEP 1 - QUICK CHECKS

| SYMPTOM | PROCEDURE |
|---|---|
| Low or No Power Output | 1. Using Test Set Model 4EX3A11 in position D, check for drive to the final power amplifier. If a typical reading of 1.2V is present, go to the Quick Checks for the POWER AMPLIFIER. If a typical reading is not present, continue to the next step.<br>2. Listen for transmit relay to close.<br>A. Check for 10 VDC at H2.<br>B. Check for <1 VDC at H3.<br>C. Voltage at Pin 2 of U1 should increase with RF applied.<br>3. Check for 10 VDC at emitter of Q2.<br>A. Replace Q2.<br>B. Replace VR1.<br>4. Check amplifier transistor Q1 and associated components.<br>A. Look for DC voltage at the collector of Q1.<br>B. Check voltage drop across R12.<br>C. Look for obvious component failures.<br>D. Replace Q1.<br>5. Check attenuator AT1. Should be <200 ohms from input to output (DC continuity). |

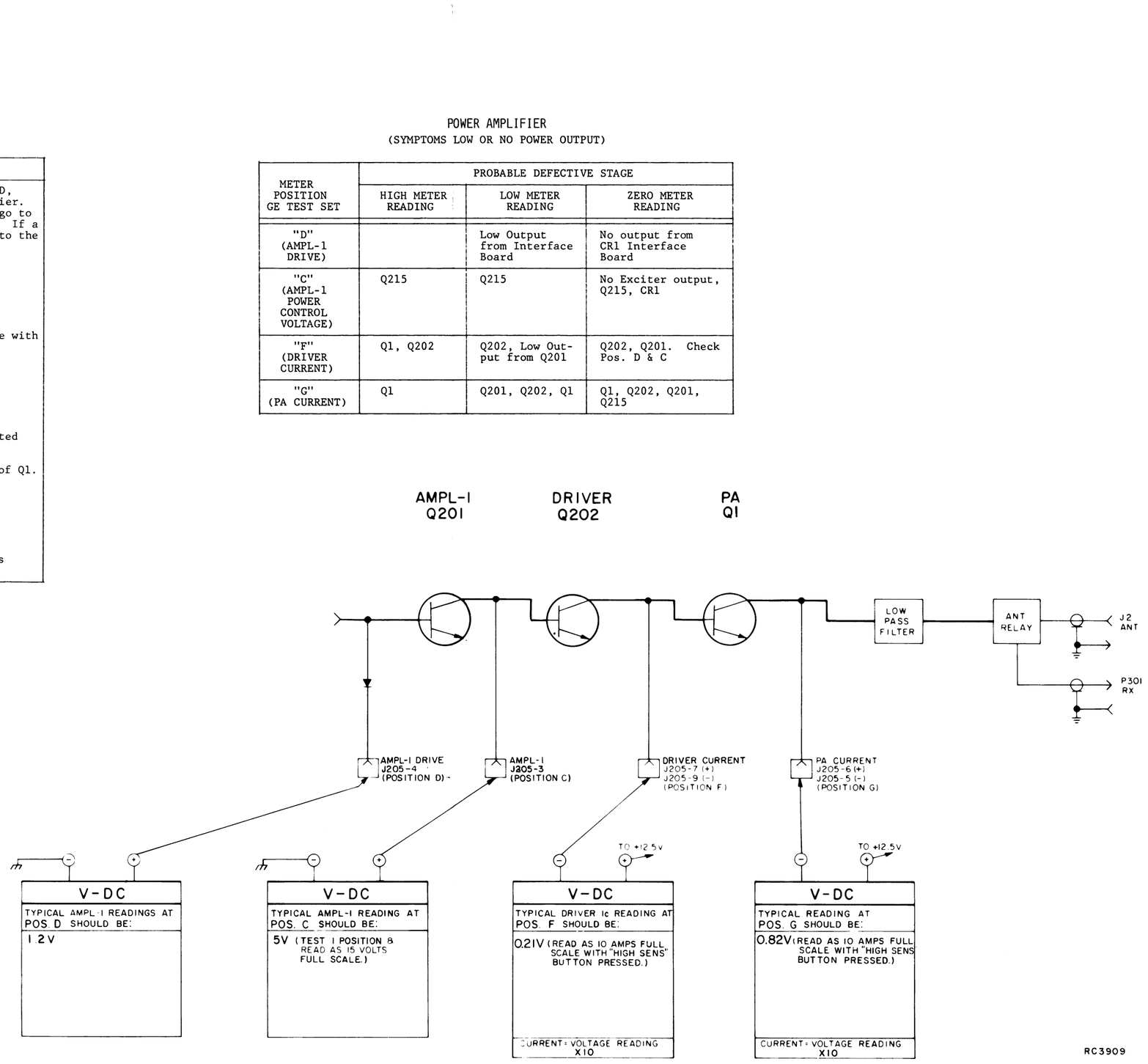
POWER AMPLIFIER
(SYMPTOMS LOW OR NO POWER OUTPUT)

| METER POSITION GE TEST SET | PROBABLE DEFECTIVE STAGE | | |
|---|---|---|---|
| | HIGH METER READING | LOW METER READING | ZERO METER READING |
| "D" (AMPL-1 DRIVE) | | Low Output from Interface Board | No output from CR1 Interface Board |
| "C" (AMPL-1 POWER CONTROL VOLTAGE) | Q215 | Q215 | No Exciter output, Q215, CR1 |
| "F" (DRIVER CURRENT) | Q1, Q202 | Q202, Low Output from Q201 | Q202, Q201. Check Pos. D & C |
| "G" (PA CURRENT) | Q1 | Q201, Q202, Q1 | Q1, Q202, Q201, Q215 |

STEP 2
CHECK TYPICAL DC VOLTAGES

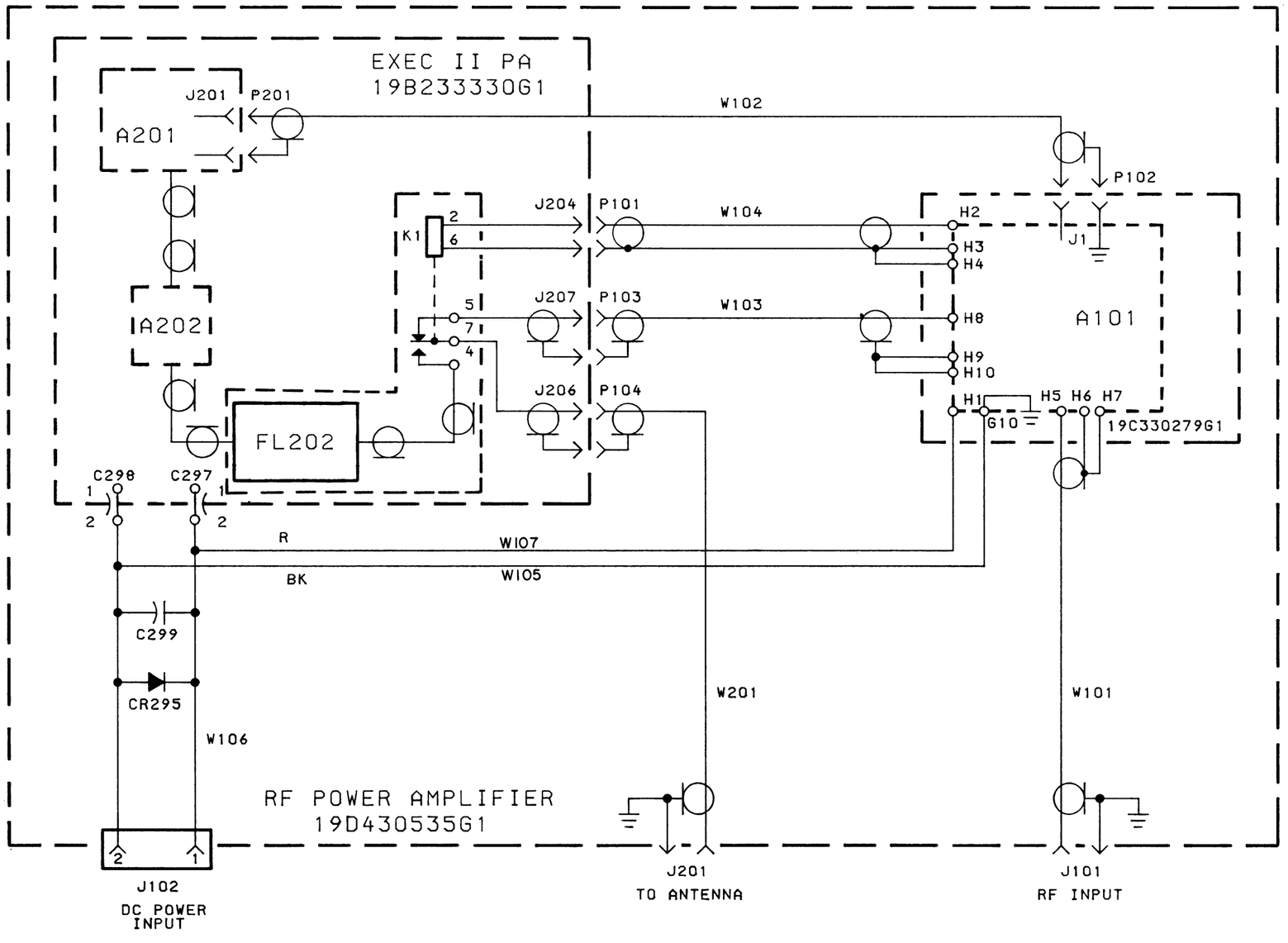
EQUIPMENT REQUIRED
- G.E. TEST MODEL 4EX3A11 OR
- 20,000 OHM-PER-VOLT METER

NOTE: ALL DC READINGS TAKEN WITH THE TRANSMITTER KEYED




# TROUBLESHOOTING PROCEDURE

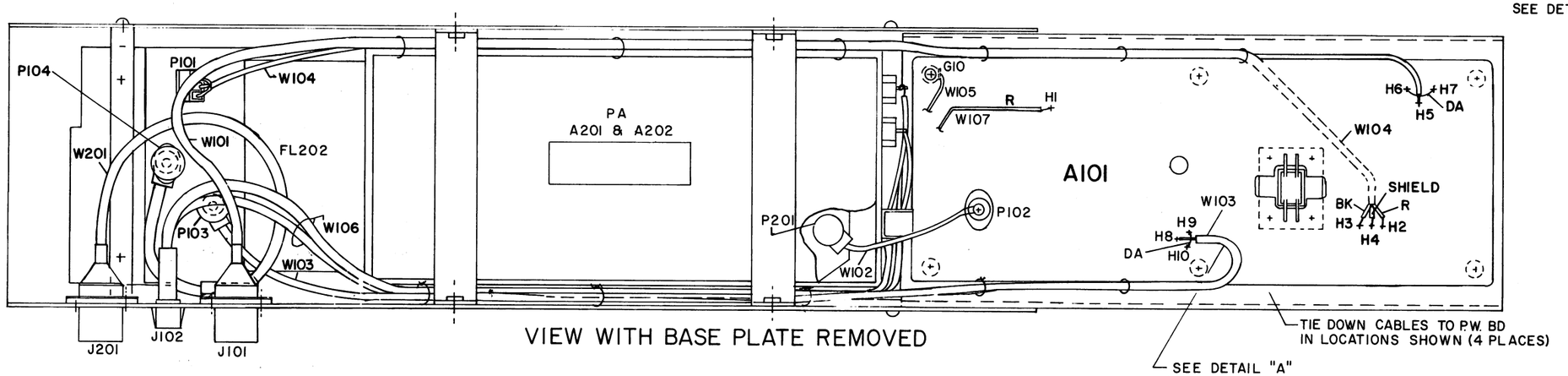
## VEHICULAR POWER AMPLIFIER (KT183A)



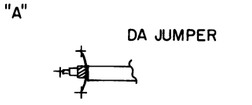

(19C330415, Rev. 2)

## INTERCONNECTION DIAGRAM

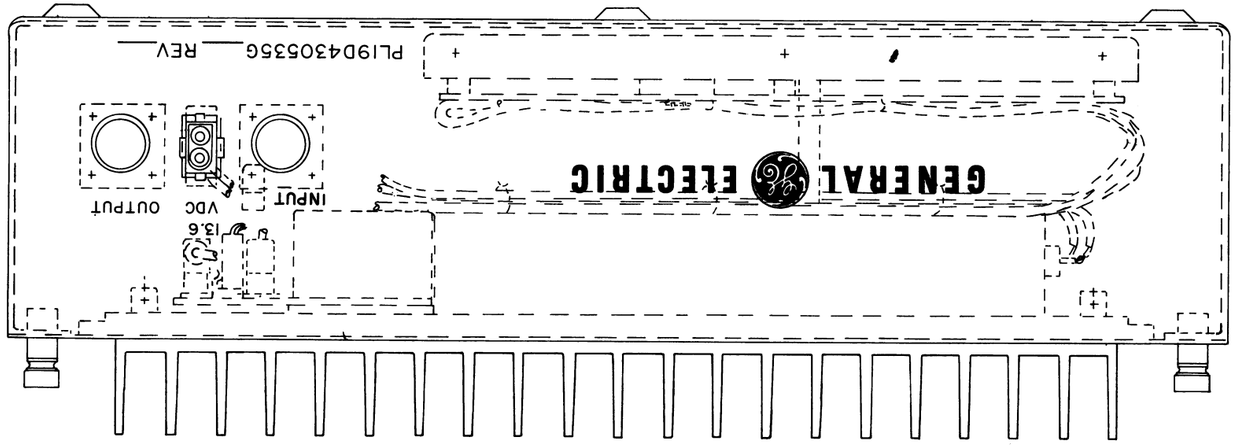
VEHICULAR POWER AMPLIFIER
(TYPE KT183A)

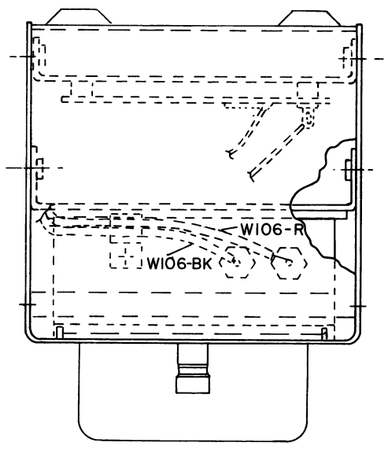



VIEW WITH BASE PLATE REMOVED




DETAIL "A"
(TYP. FOR W101 & W103)



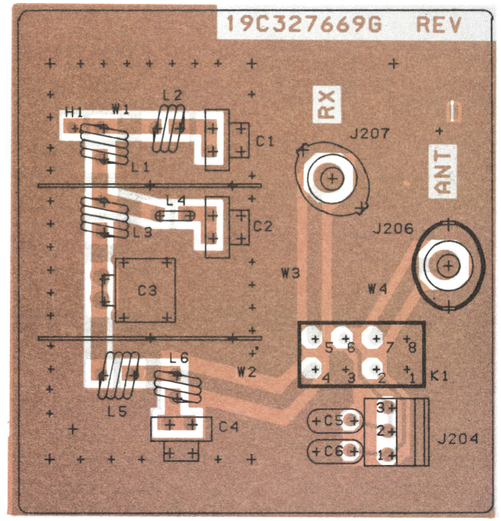




(19D430968, Rev. 1)

## OUTLINE DIAGRAM

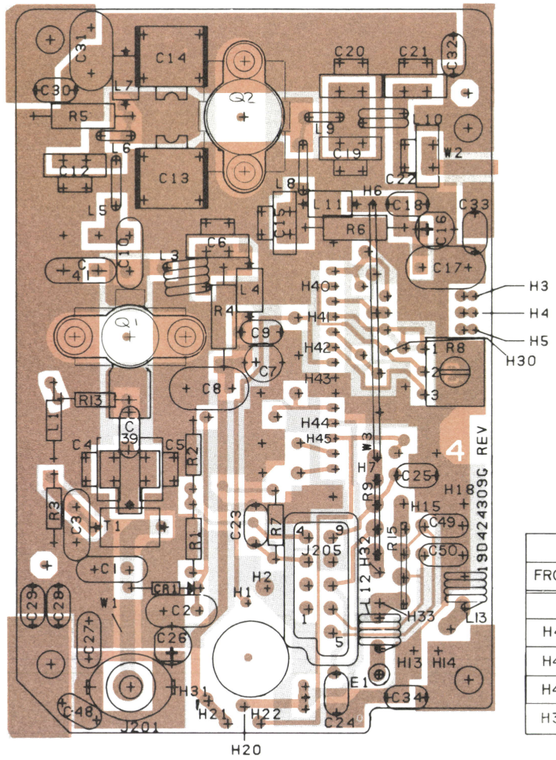
VEHICULAR POWER AMPLIFIER

## FL202




(19C327916, Rev. 0)
(19B227884, Sh. 1, Rev. 0)
(19B227884, Sh. 2, Rev. 0)

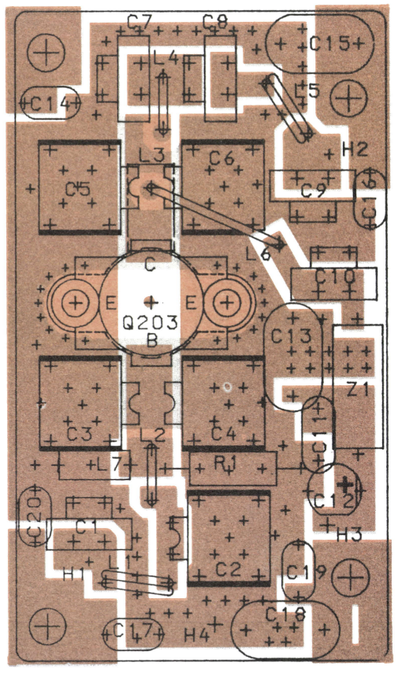
## A201




| CONNECTIONS CHART | | | |
|---|---|---|---|
| FROM | TO | WIRE SIZE | REMARKS |
| | | | |
| H40 | H45 | DA | SLEEVE |
| H41 | H43 | DA | SLEEVE |
| H42 | H44 | DA | SLEEVE |
| H32 | H33 | DB | |

(19C330469, Rev. 1)
(19B227634, Sh. 1, Rev. 4)
(19B227634, Sh. 2, Rev. 3)

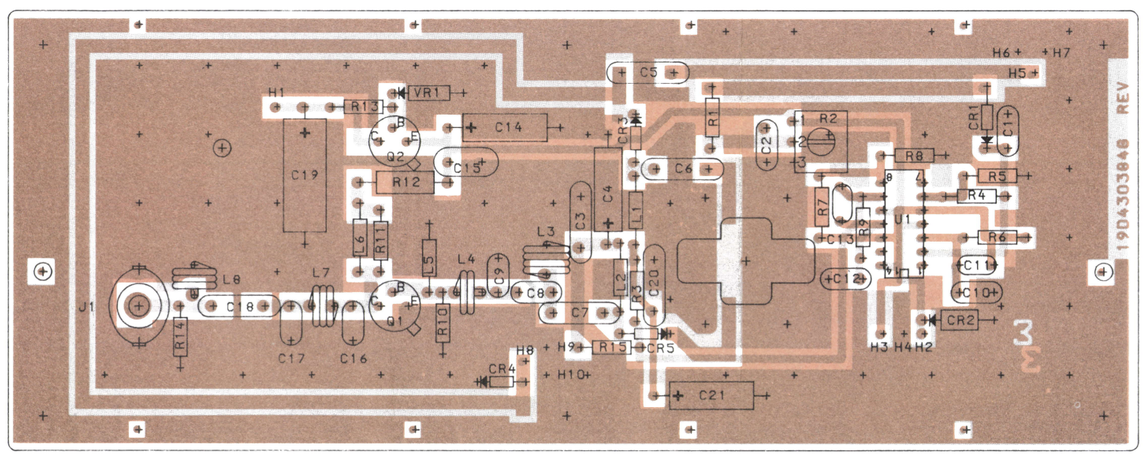
## A202




(19C327373, Rev. 3)
(19B227346, Sh. 1, Rev. 1)
(19B227346, Sh. 2, Rev. 1)

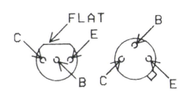
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

## INTERFACE BOARD
## A101




(19D430385, Rev. 4)
(19A138499, Sh. 1, Rev. 3)
(19A138499, Sh. 2, Rev. 3)

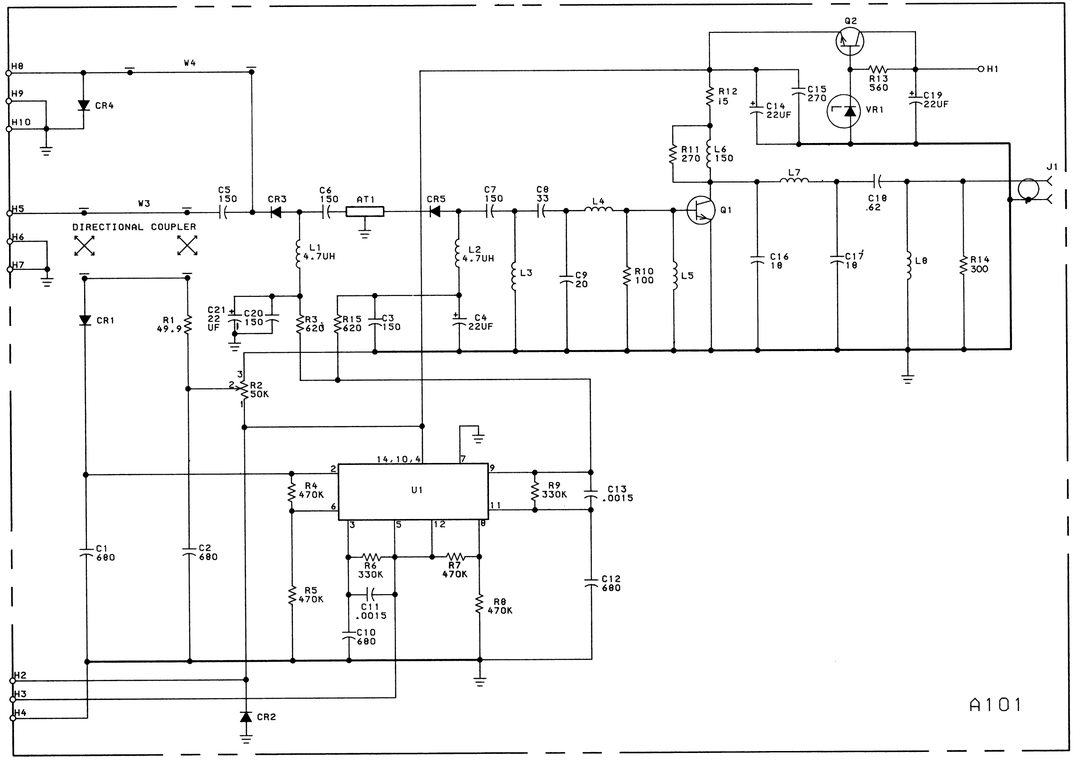
LEAD IDENTIFICATION
FOR Q1 & Q2




NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

## OUTLINE DIAGRAMS

VEHICULAR POWER AMPLIFIER

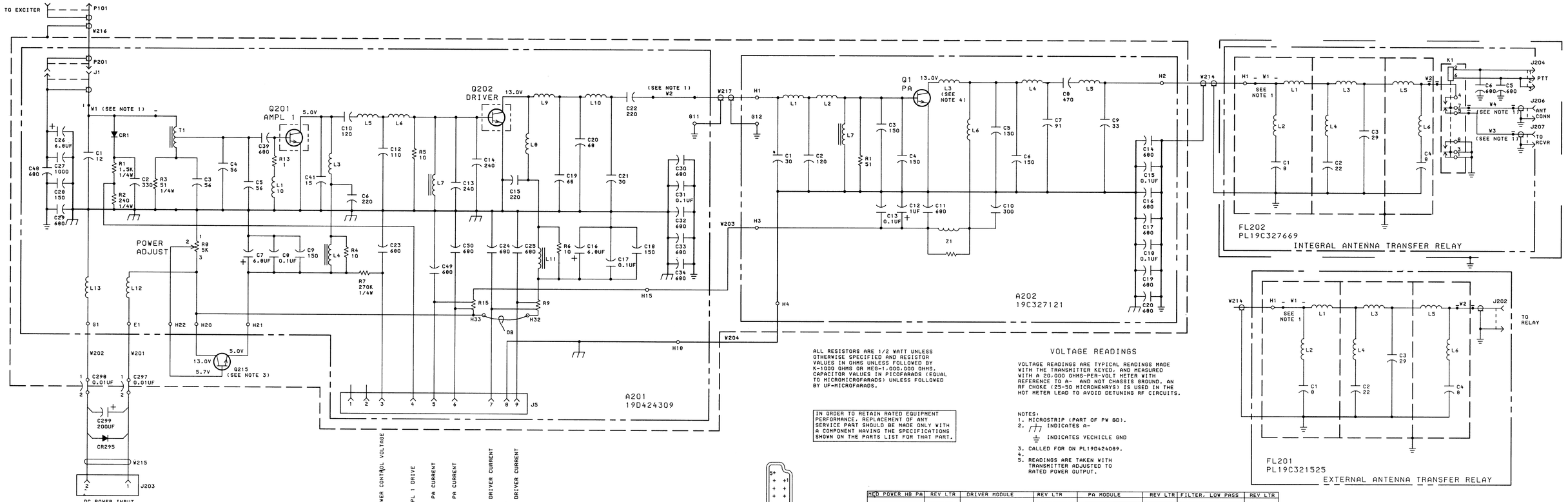



(19D430517, Rev. 2)

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

## SCHEMATIC DIAGRAM

INTERFACE BAORD
19D430384G1




## SCHEMATIC DIAGRAM

**POWER AMPLIFIER**
**19B233330G1**

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K-1000 OHMS OR MEG-1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF-MICROFARADS.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

### VOLTAGE READINGS

VOLTAGE READINGS ARE TYPICAL READINGS MADE WITH THE TRANSMITTER KEYED, AND MEASURED WITH A 20,000 OHMS-PER-VOLT METER WITH REFERENCE TO A- AND NOT CHASSIS GROUND. AN RF CHOKE (25-50 MICROHENRYS) IS USED IN THE HOT METER LEAD TO AVOID DETUNING RF CIRCUITS.

NOTES:
1. MICROSTRIP (PART OF PW BD).
2. ⏚ INDICATES A-
   ⏚ INDICATES VECHICLE GND
3. CALLED FOR ON PL19D424089.
4. -
5. READINGS ARE TAKEN WITH TRANSMITTER ADJUSTED TO RATED POWER OUTPUT.

J5 (TOP VIEW)

| MED POWER HB PA | REV LTR | DRIVER MODULE | REV LTR | PA MODULE | REV LTR | FILTER, LOW PASS | REV LTR |
|---|---|---|---|---|---|---|---|
| PL19D424G0961 | A | PL19D424309G5 | | PL19C327121G1 | | PL19C321525G1 | |
| PL19D424G0902 | A | PL19D424309G5 | | PL19C327121G1 | | PL19C327669G1 | |

(19R622428, Rev. 1)

## PARTS LIST

VHF RF POWER AMPLIFIER
19D430535G1 (KT-183-A)
ISSUE 2

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| | | - - - - - - - - - - - - CABLES - - - - - - - - - - - - |
| W102 | 19A130909G1 | Cable. Includes P102 & P201. |
| W106 | | CABLE ASSEMBLY 19B233332G1 |
| | | - - - - - - - - JACKS AND RECEPTACLES - - - - - - - - |
| J102 | | Connector. Includes: |
| | 19A134281P2 | Shell. |
| | 19A134282P4 | Contact, electrical: Wire size No. 14-10; sim to AMP 350201-2. |
| | 7117269P1 | Terminal, solderless. (Located on opposite end of cable from connector). |
| W201 | | CABLE ASSEMBLY 19A129312G8 |
| | | - - - - - - - - JACKS AND RECEPTACLES - - - - - - - - |
| J201 | | Connector. Includes: |
| | 4029493P1 | Receptacle, coaxial: sim to Amphenol 83-798 or Equiv. Military SO-239A. |
| | 4029082P2 | Cover. |
| | | - - - - - - - - - - - - PLUGS - - - - - - - - - - - - |
| P104 | 5491689P122 | Plug. (Includes approx 10 inch cable). |
| | | PRINTED WIRE BOARD SUPPORT 19C330279G1 |
| A101 | | INTERFACE BOARD 19D430384G1 |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1 and C2 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C3 | 19A116656P150J0 | Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C4 | 5496267P10 | Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| C5 thru C7 | 19A116656P150J0 | Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C8 | 5493218P351 | Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -150 PPM. |
| C9 | 19A116656P20J0 | Ceramic disc: 20 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C10 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C11 | 19A700005P2 | Polyester: 15 pf ±10%, 50 VDCW. |
| C12 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C13 | 19A700005P2 | Polyester: 15 pf ±10%, 50 VDCW. |
| C14 | 5496267P10 | Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| C15 | 19A700105P46 | Mica: 270 pf ±5%, 500 VDCW. |
| C16 and C17 | 19A116656P18J0 | Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C18 | 19A116656P62J0 | Ceramic disc: 62 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C19 | 5496267P19 | Tantalum: 22 µf ±20%, 35 VDCW; sim to Sprague Type 150D. |
| C20 | 19A116656P150J0 | Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C21 | 5496267P10 | Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| | | - - - - - - - DIODES AND RECTIFIERS - - - - - - - |
| CR1 | 19A116052P2 | Hot carrier: Fwd. drop .410 volts max. |
| CR2 | 4037822P1 | Silicon, 1000 mA, 400 PIV. |
| CR3 thru CR5 | 19A116925P1 | Silicon, pin: 35 volt Reverse Breakdown, 400 mW. |
| | | - - - - - - - JACKS AND RECEPTACLES - - - - - - - |
| J1 | 19A130924G1 | Connector, receptacle: coaxial, jack type; sim to Cinch 14H11613. |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 and L2 | 19A700024P21 | Coil, RF: 4.7 µh ±10%, 1.20 ohms DC res max. |
| L3 | 19C320617P5 | Coil. |
| L4 | 19A129355P2 | Coil. |
| L5 | 19A700024P23 | Coil, RF: 6.8 µh ±10%, 2.00 ohms DC res max. |
| L6 | 19B209420P103 | Coil, RF: 0.15 µh ±10%, 0.10 ohms DC res max; sim to Jeffers 4416-3K. |
| L7 | 19A129352P1 | Coil. |
| L8 | 19C320617P25 | Coil. |
| | | - - - - - - - - - TRANSISTORS - - - - - - - - - |
| Q1 | 19A116868P1 | Silicon, NPN; sim to Type 2N4427. |
| Q2 | 19A115300P2 | Silicon, NPN; sim to Type 2N3053. |
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 | 19A701250P68 | Metal film: 49.9 ohms ±1%, 1/4 w. |
| R2 | 19A116559P108 | Variable, cermet: 50K ohms ±20%, 0.5 w; sim to CTS Series 360. |
| R3 | 3R152P621J | Composition: 620 ohms ±5%, 1/4 w. |
| R4 and R5 | 3R152P474J | Composition: 470K ohms ±5%, 1/4 w. |
| R6 | 3R152P334J | Composition: 330K ohms ±5%, 1/4 w. |
| R7 and R8 | 3R152P474J | Composition: 470K ohms ±5%, 1/4 w. |
| R9 | 3R152P334J | Composition: 330K ohms ±5%, 1/4 w. |
| R10 | 19A700106P39 | Composition: 100 ohms ±5%, 1/4 w. |
| R11 | 3R152P271J | Composition: 270 ohms ±5%, 1/4 w. |
| R12 | 19A700113P19 | Composition: 15 ohms ±5%, 1/2 w. |
| R13 | 3R152P121J | Composition: 120 ohms ±5%, 1/4 w. |
| R14 | 3R152P301J | Composition: 300 ohms ±5%, 1/4 w. |
| R15 | 3R152P621J | Composition: 620 ohms ±5%, 1/4 w. |
| | | - - - - - - - INTEGRATED CIRCUITS - - - - - - - |
| U1 | 19A116968P3 | Linear, timer: 14 Pin Dip Package; sim to Signetics SA556N. |
| | | - - - - - - - VOLTAGE REGULATORS - - - - - - - |
| VR1 | 4036887P8 | Zener: 500 mW, 11.0 v. nominal. |
| | | - - - - - - - - - ATTENUATORS - - - - - - - - - |
| AT1 | 19B233367G1 | Attenuator. |
| | | - - - - - - - - - - - - CABLES - - - - - - - - - - - - |
| W101 | | CABLE ASSEMBLY 19A142634G1 |
| | | - - - - - - - - JACKS AND RECEPTACLES - - - - - - - - |
| J101 | | Connector. Includes: |
| | 19A700067P1 | Receptacle, coaxial: sim to Amphenol 83-798 or Equiv. Military SO-239A. |
| | 4029082P2 | Cover. |
| | 19B209044P13 | Cable, RF: sim to Essex 421-105. |
| W103 | 5491689P136 | Cable. Includes P103. |
| W104 | | CABLE ASSEMBLY 19A142633G1 |
| | | - - - - - - - - - - - - PLUGS - - - - - - - - - - - - |
| P101 | | Connector. Includes: |
| | 19A116659P14 | Shell. |
| | 19A116781P6 | Contact, electrical: Wire range No. 22-26 AWG; sim to Molex 08-50-0138. |
| | | POWER AMPLIFIER 19B233330G1 (19D424088G2) |
| A201* | | POWER AMPLIFIER MODULE 19D423719G2 (Deleted by REV A) |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1 | 19A116656P12J0 | Ceramic disc: 12 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C2 | 7489162P39 | Silver mica: 330 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. |
| C3 | 19A700105P28 | Mica: 56 pf ±5%, 500 VDCW. |
| C4 | 19A700015P30 | Metallized teflon: 110 pf ±5%, 250 VDCW. |
| C6 | 19A700015P37 | Metallized teflon: 220 pf ±5%, 250 VDCW. |
| C7 | 19A134202P15 | Tantalum: 6.8 µf ±20%, 35 VDCW. |
| C8 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C9 | 19A116655P8 | Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C10 | 19A700105P34 | Mica: 100 pf ±5%, 500 VDCW. |
| C11 | 19A700105P14 | Mica: 18 pf ±5%, 500 VDCW. |
| C12 | 19A700015P30 | Metallized teflon: 110 pf ±5%, 250 VDCW. |
| C13 and C14 | 19A700014P38 | Metallized teflon: 240 pf ±5%, 250 VDCW. |
| C15 | 19A116679P470K | Mica: 470 pf ±10%, 250 VDCW. |
| C16 | 19A134202P15 | Tantalum: 6.8 µf ±20%, 35 VDCW. |
| C17 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C18 | 19A116655P8 | Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C19 and C20 | 19A700015P25 | Teflon/mica: 68 pf ±5%, 250 VDCW. |
| C21 | 19A700015P16 | Teflon/mica: 30 pf ±5%, 250 VDCW. |
| C22 | 19A700015P37 | Metallized teflon: 220 pf ±5%, 250 VDCW. |
| C23 thru C25 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C26 | 19A134202P15 | Tantalum: 6.8 µf ±20%, 35 VDCW. |
| C27 | 19A116655P19 | Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C28 | 19A116655P20 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C29 | 19A116655P8 | Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C30 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C31 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C32 thru C36 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| | | - - - - - - - DIODES AND RECTIFIERS - - - - - - - |
| CR1 | 19A115250P1 | Silicon, fast recovery, 225 ma, 50 PIV. |
| | | - - - - - - - - - - TERMINALS - - - - - - - - - - |
| E1 and E2 | 19A134263P1 | Contact, electrical; sim to Selectro X-L-070174-1. |
| | | - - - - - - - JACKS AND RECEPTACLES - - - - - - - |
| J1 | 19A130924G1 | Connector, coaxial: jack type; sim to Cinch 14H11613. |
| J5 | 19B219374G1 | Connector: 9 contacts. |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 | 19A700024P25 | Coil, RF: 10.0 µh ±10%, 3.70 ohms DC res max. |
| L2 | | (Part of printed board 19D423718P1). |
| L3 | 19A136530P1 | Coil. |
| L4 | 19A129773G1 | Coil. |
| L5 | 19A136532P1 | Coil. |
| L6 | 19A129575P1 | Coil. |
| L7 | 19A129773G1 | Coil. |
| L8 | 19A136531P2 | Coil. |
| L9 | 19A129575P1 | Coil. |
| L10 | 19A136533P1 | Coil. |
| L11 | 19A129773G1 | Coil. |
| L12 and L13 | 19A129569P1 | Coil. |
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 | 19A700106P61 | Composition: 820 ohms ±5%, 1/4 w. |
| R2 | 19A700106P49 | Composition: 270 ohms ±5%, 1/4 w. |
| R3 | 19A700106P32 | Composition: 51 ohms ±5%, 1/4 w. |
| R4 thru R6 | 19A700113P15 | Composition: 10 ohms ±5%, 1/2 w. |
| R7 | 3R152P274J | Composition: 270K ohms ±5%, 1/4 w. |
| R8 | 19A116559P102 | Variable, cermet: 5K ohms ±20%, .5 w; sim to CTS Series 360. |
| R9 and R10 | 19C320212P2 | Shunt resistor. |
| | | - - - - - - - - - TRANSFORMERS - - - - - - - - - |
| T1 | 19A129564G1 | Transformer. |
| | | - - - - - - - - - - CABLES - - - - - - - - - - |
| W1 | | (Part of printed board 19D423718P1). |
| A201* | | POWER AMPLIFIER MODULE 19D424309G5 (Added by REV A) |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1A | 19A700105P8 | Mica: 12 pf ±5%, 500 VDCW. |
| C2 | 7489162P39 | Silver mica: 330 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. |
| C3 | 19A700105P28 | Mica: 56 pf ±5%, 500 VDCW. |
| C4A and C5A | 19A700015P23 | Metallized teflon: 56 pf ±5%, 250 VDCW. |

Cont' on page 14

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| C6 | 19A700015P37 | Metallized teflon: 220 pf ±5%, 250 VDCW. |
| C7 | 19A134202P15 | Tantalum: 6.8 µf ±20%, 35 VDCW. |
| C8 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C9 | 19A116655P8 | Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C10B | 19A700105P36 | Mica: 120 pf ±5%, 500 VDCW. |
| C12 | 19A700315P30 | Metallized teflon: 110 pf ±5%, 250 VDCW. |
| C13B | 19A700014P38 | Metallized teflon: 240 pf ±5%, 250 VDCW. |
| C14B | 19A700014P38 | Metallized teflon: 240 pf ±5%, 250 VDCW. |
| C15 | 19A700015P37 | Metallized teflon: 220 pf ±5%, 250 VDCW. |
| C16 | 19A134202P15 | Tantalum: 6.8 µf ±20%, 35 VDCW. |
| C17 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C18 | 19A116655P8 | Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C19 | 19A700015P25 | Mica: 68 pf ±5%, 250 VDCW. |
| C20B | 19A700015P25 | Metallized teflon: 68 pf ±5%, 250 VDCW. |
| C21A | 19A700015P16 | Metallized teflon: 30 pf ±5%, 250 VDCW. |
| C22A | 19A700015P37 | Metallized teflon: 220 pf ±5%, 250 VDCW. |
| C23 thru C25 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C26 | 19A134202P15 | Tantalum: 6.8 µf ±20%, 35 VDCW. |
| C27 | 19A116655P19 | Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C28 | 19A116655P8 | Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C29 and C30 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C31 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C32 thru C34 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C39 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C41 | 19A700105P11 | Mica: 15 pf ±5%, 500 VDCW. |
| C48 thru C50 | 19A116655P18 | Ceramic disc: 680 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| | | - - - - - - - DIODES AND RECTIFIERS - - - - - - |
| CR1 | 19A115250P1 | Silicon, fast recovery, 225 mA, 50 PIV. |
| | | - - - - - - - - - - TERMINALS - - - - - - - - - |
| E1 | 19A134263P1 | Contact, electrical: sim to Selectro 229-1082-00-0-590. |
| G1 | 19A134263P1 | Contact, electrical: sim to Selectro 229-1082-00-0-590. |
| | | - - - - - - - - - JACKS AND RECEPTACLES - - - - - |
| J201 | 19A130924G1 | Connector, receptacle: coaxial, jack type; sim to Cinch 14H11613. |
| J205 | 19B219374G1 | Connector: 9 contacts. |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 | 19A700024P25 | Coil, RF: 10.0 µh ±10%, 3.70 ohms DC res max. |
| L3A | 19A136530P1 | Coil. |
| L4 | 19A129773G1 | Coil. |
| L5B | 19A136532P1 | Coil. |
| L6 | 19A129575P1 | Coil. |
| L7 | 19A129773G1 | Coil. |
| L8B | 19A136531P1 | Coil. |
| L9B | 19A129575P1 | Coil. |
| L10B | 19A136533P1 | Coil. |

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| L11 | 19A129773G1 | Coil. |
| L12 and L13 | 19A129569P1 | Coil. |
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 | 19A700106P67 | Composition: 1.5K ohms ±5%, 1/4 w. |
| R2 | 3R152P241J | Composition: 240 ohms ±5%, 1/4 w. |
| R3 | 19A700106P32 | Composition: 51 ohms ±5%, 1/4 w. |
| R4 | 19A700113P15 | Metallized teflon: 10 ohms ±5%, 1/2 w. |
| R5B and R6 | 19A700113P15 | Metallized teflon: 10 ohms ±5%, 1/2 w. |
| R7 | 3R152P274J | Composition: 270K ohms ±5%, 1/4 w. |
| R8B | 19A116559P102 | Variable, cermet: 5K ohms ±20%, 0.5 w; sim to CTS Series 360. |
| R9 | 19C320212P2 | Shunt resistor. |
| R13 | 19A116216P1R0J | Deposited carbon: 1.0 ohms ±5%, 1/4 w; sim to Amperex Type B803104 Style CR25. |
| R15 | 19C320212P2 | Shunt resistor. |
| | | - - - - - - - - - - TRANSFORMERS - - - - - - - - - - |
| T1 | 19A129564G1 | Coil. |
| | | - - - - - - - - - - - CABLES - - - - - - - - - - |
| W1 and W2 | | (Part of printed board 19D424308P1). |
| W3 | 19B227912P1 | Jumper. |
| A202 | | POWER AMPLIFIER MODULE 19C327121G1 |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1 | 19A700015P16 | Metallized teflon: 30 pf ±5%, 250 VDCW. |
| C2 | 19A116795P120J | Teflon/mica: 120 pf ±5%, 250 VDCW. |
| C3 thru C6 | 19A700014P33 | Metallized teflon: 150 pf ±5%, 250 VDCW. |
| C7 | 19A700015P28 | Metallized teflon: 91 pf ±5%, 250 VDCW. |
| C8 | 19A700015P45 | Metallized teflon: 470 pf ±5%, 250 VDCW. |
| C9 | 19A700015P17 | Metallized teflon: 33 pf ±5%, 250 VDCW. |
| C10 | 19A700015P40 | Metallized teflon: 300 pf ±5%, 250 VDCW. |
| C11 | 19A116655P17 | Ceramic disc: 680 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C12 | 19A134202P14 | Tantalum: 1 µf ±20%, 35 VDCW. |
| C13 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C14 | 19A116655P17 | Ceramic disc: 680 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C15 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C16 and C17 | 19A116655P17 | Ceramic disc: 680 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C18 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C19 and C20 | 19A116655P17 | Ceramic disc: 680 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 | 19A136713P1 | Coil. |
| L2 | 19A136714P1 | Coil. |
| L3 | | (Part of printed board 19C327120P1). |
| L4 | 19A136715P1 | Coil. |
| L5 | 19A136713P1 | Coil. |
| L6 | 19A136716P1 | Coil. |
| L7 | 19A129773G1 | Coil. |

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 | 19A700113P32 | Composition: 51 ohms ±5%, 1/2 w. |
| | | - - - - - - - - - - NETWORKS - - - - - - - - - - |
| Z1 | | FILTER ASSEMBLY 19B219649G1 |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 | 19A129346G2 | Coil. |
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 | 3R78P100K | Composition: 10 ohms ±10%, 1 w. |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C297 and C298 | 19A116708P1 | Ceramic, feed-thru: 0.01 µf +100% -0%, 500 VDCW; sim to Erie Style 327. |
| C299 | 19A115680P10 | Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX. |
| | | - - - - - - - - DIODES AND RECTIFIERS - - - - - |
| CR295 | 19A116783P1 | Rectifier, silicon: 100 VDC blocking, 6 amps. |
| | | - - - - - - - - - - FILTERS - - - - - - - - - - |
| FL202 | | COMPONENT BOARD 19C327669G1 |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1 | 19A116679P8D | Metallized teflon: 8 pf ±.5 pf, 250 VDCW. |
| C2 | 19A700015P12 | Metallized teflon: 22 pf ±5%, 250 VDCW. |
| C3 | 19A116795P29J | Silver mica: 29 pf ±5%, 250 VDCW; sim to Underwood Type J1HF. |
| C4 | 19A116679P8D | Metallized teflon: 8 pf ±.5 pf, 250 VDCW. |
| C5 and C6 | 19A116655P20 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| | | - - - - - - - JACKS AND RECEPTACLES - - - - - - |
| J204 | 19A116659P55 | Connector, printed wiring: 3 contacts; sim to Molex 09-65-1031. |
| J206 and J207 | 19A130924G1 | Connector, receptacle: jack type; sim to Cinch 14H11613. |
| | | - - - - - - - - - - RELAYS - - - - - - - - - - |
| K1 | 19A700061P1 | Hermetic sealed: 180 to 341 ohms coil res, 8-16.3 VDC; sim to GE 3SAY1760A2, CP Clare HFW-1201558 or Potter-Brumfield HCM6160. |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 | 19A129569P1 | Coil. |
| L2 | 19A129570P1 | Coil. |
| L3 | 19A129569P1 | Coil. |
| L4 | 19A129575P1 | Coil. |
| L5 | 19A129569P1 | Coil. |
| L6 | 19A129570P1 | Coil. |
| | | - - - - - - - - - - CABLES - - - - - - - - - - |
| W1 thru W4 | | (Part of printed board 19C327670P1). |
| | | - - - - - - - - - - TRANSISTORS - - - - - - - - - |
| Q201 | 19A134340P1 | Silicon, NPN. |
| Q202 | 19A134340P2 | Silicon, NPN. |
| Q203 | 19A134387P1 | Silicon, NPN, VHF Amplifier: 70 Watts, 12.5 v. |
| Q215 | 19A116742P1 | Silicon, NPN. |

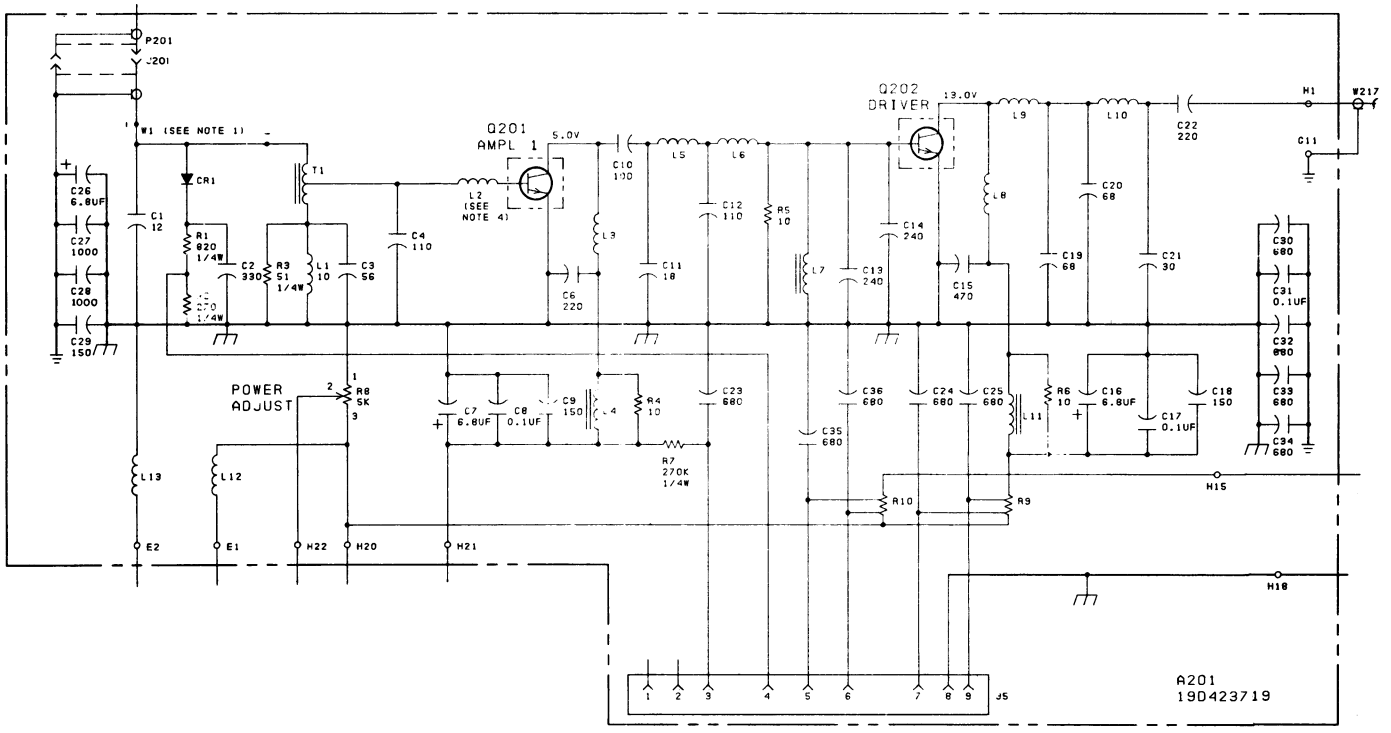
| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| | | - - - - - - - - - - - CABLES - - - - - - - - - - - |
| W201 | 19B227024P1 | Jumper. |
| W202 | 19B227025G1 | Jumper. |
| W203 | 19B227484P2 | Jumper. |
| W204 | 19B227484P1 | Jumper. |
| W214 | 19A130607G1 | Cable, RF: approx 1 foot long. |
| W215 | 19B227058G1 | Cable: approx 1 foot long. |
| W216 | 19A130909G1 | Cable, RF: approx 7-1/2 inches long. |
| W217 | 19A136529G2 | Cable: approx 2 inches long. |
| | | - - - - - - - - - MISCELLANEOUS - - - - - - - - - |
| | 19B233324G1 | Base plate. |
| | 19B233326G1 | Cover. |
| | 4029851P6 | Clip loop. (Secures W101, W103, W104, W106). |
| | 19A121759P1 | Thumbscrew. (Secures Cover). |
| | 4033714P11 | Terminal, solderless. (Located at G10). |
| | 19B233325G1 | Support. (A101). |
| | 19B233367G1 | Attenuator. (AT1). |
| | 4036555P1 | Insulator, washer: nylon. (Used with Q1 & Q2 on A101). |
| | 19A142616P1 | Spacer. (Secures heat sink to cover). |
| | 19C321591G4 | Heat sink. |
| | 19D416275P3 | Casting. |
| | 19C327282P1 | Insulator. (Located under A201). |
| | 19A129434P1 | Washer. (Located on C297 & C298). |
| | 7878455P2 | Solderless terminal. (Located at G11 & G12). |
| | 4029851P6 | Clip loop. (Secures W215). |
| | 19A130568P1 | Plate. (Mounts Q215). |
| | 19A116023P1 | Insulator, plate. (Used with Q215). |
| | 19A134016P1 | Insulator, bushing. (Used with Q215). |
| | N44P9006C6 | Machine screw: No. 4-40 x 3/8. (Secures Q201-Q203). |
| | 19B201074P305 | Tap screw, Phillips POZIDRIV®: No. 6-32 x 5/16. (Secures A201 & A202). |
| | 19B201074P312 | Tap screw, Phillips POZIDRIV®: No. 6-32 x 3/4. (Secures filter casting). |
| | 7139898P3 | Hex nut: 1/4-28. (Secures C297 & C298). |

# PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter," which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A - Power Amplifier 19D424089G2
To incorporate a common printed wire board.
Changed A201.

Outline Diagram was:




Schematic Diagram was: