MOBILE RADIO

150-174 MHz, 110 WATT POWER AMPLIFIER 19D900351G1
138-174 MHz, 40 WATT POWER AMPLIFIER 19D900351G2, G3

TABLE OF CONTENTS

DESCRIPTION

The PA assembly uses five RF power transistors to provide 110 watts of output power, or 3 RF transistors to provide 40 watts of output power. The output power is adjustable over a range of 55 to 110 watts in the high power PA, and 20 to 40 watts in the medium power PA. Five transistors are used in the power control circuit.

Supply voltage for the PA is connected from power leads on the Transmit-Receive-System (TRS) board through feedthrough capacitors A2-C1 and C2 to hole 11 (A+) and hole 12 (A-) on the PA board. C52, C53, and L23, and L24 prevent RF from getting on the power leads. Diode D5 will cause the main fuse in the fuse assembly to blow if the polarity of the power leads is reversed.

The PA assembly is insulated from vehicle ground by C33 through C44 to permit operation in positive or negative ground vehicles.

NOTE

In positive ground vehicles, A- is "hot" with respect to vehicle ground. Shorting the transmitter PA printed wiring board ground pattern to the radio case may cause one of the in-line fuses to blow.

PA metering Jack J1 is provided for use with GE Test Set Model 4EX3A11 or Test Kit 4EX8K12 with a cable adaptor. The Test Set meters the RF drive (exciter output), control voltage, driver current, PA current and PA voltage.

CIRCUIT ANALYSIS

RF AMPLIFIERS

The exciter output is coupled through P101 on the TRS board to PA input jack J3. The RF is coupled through a 50 ohm stripline and then through T1, stripline Z6, L1 and Z7 to the base of 1st RF Driver Q1.

Part of the RF is rectified by D1 and applied to RF Switch A1-Q3 to activate the power control circuitry. Part of the DC voltage is applied to voltage dividers R1 and R2 for metering the exciter output at J1.

The RF amplifiers consist of three Class C, common-emitter amplifiers. In 40 watt transmitters, Q3 is the PA stage. R17, L12 and L42 are a stabilizing network in the base of Q3. The output of Q3 is coupled through 50 ohm coaxial cable W3 to the low pass filter and then to the antenna relay.

Driver current is metered at J1 (Driver Current). The reading is taken on the one-volt scale with the High Sensitivity button pressed, and with the meter polarity switch in the minus (-) position. The meter is read as 15 amperes full scale. Jumpers W3, W5 and W7 act as shunt resistors for the metering circuit.

In 110 watt transmitters, the 40 watt output is coupled through jumper W1 to a Wilkinson power splitter consisting of C57, C59, L26, L27 and Z1.

The power amplifier stages consist of two identical paralleled Class C power amplifiers (Q5 and Q6).

L30, L32, R24 and C63 make up a stabilizing network in the base of Q6, while L31, L33, R25 and C68 make up the stabilizing network in the base of Q5. Supply voltage (A+) for Q5 and Q6 is coupled through collector feed networks Z3 and Z4.

Collector current for Q5 and Q6 is measured at J1 (PA Current). The reading is taken on the one-volt scale with the high sensitivity button pressed and the polarity switch in the minus (-) position. The current is read as 30 amperes full scale.

The output of Q5 and Q6 is applied to a Wilkinson power combiner consisting of C78, L40, Z2, L41 and C79. The output of the combiner is coupled through T2 and two 50 ohm striplines (Z16 and Z17) to the low pass filter. The filter output is coupled through 50 ohm stripline to Z18 to the antenna relay (K1).

WARNING

The RF Power Transistors used in the transmitter contain Beryilium 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 CONTROL CIRCUIT

The power control circuit provides power leveling as well as thermal protection for the PA.

When the transmitter is keyed, RF is rectified by D1. The resulting DC turns on RF switch A1-Q4. This allows A1-Q2, A1-Q1 and pass transistor Q4 to turn on. Turning on Q4 applies collector voltage to 1st RF driver Q1.

If the power output should start to increase above the level set by R23, A1-Q3 will start to conduct. This causes A1-Q2, A1-Q1 and Q3 to conduct less, reducing the collector voltage to the 1st RF driver.

Thermal protection is provided by temperature compensating resistor R19. As the heat sink temperature rises above 70°C, the resistance of R19 decreases. This causes A1-Q2, A1-Q1 and Q3 to conduct less, reducing the power output.

CAUTION

Do not operate the transmitter at levels higher than rated output. Operating at higher than rated output will shorten the life of the RF power transistor.

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

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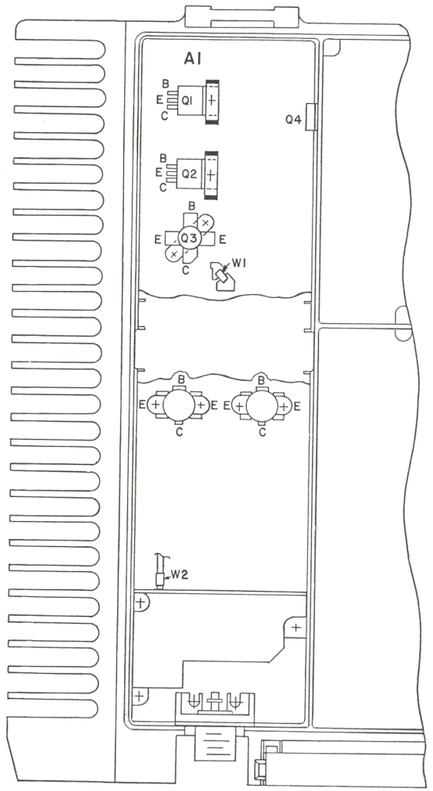
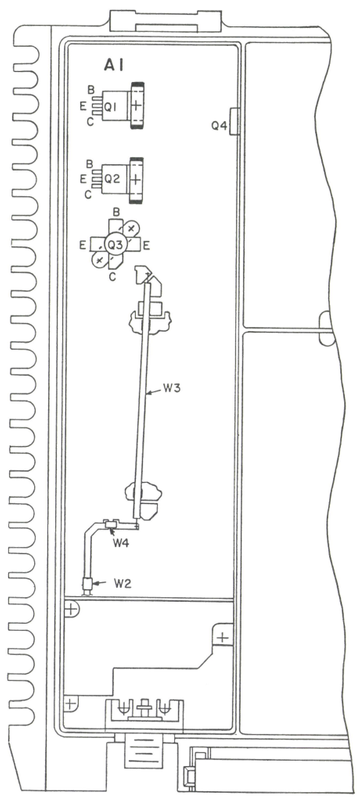
U.S.A.

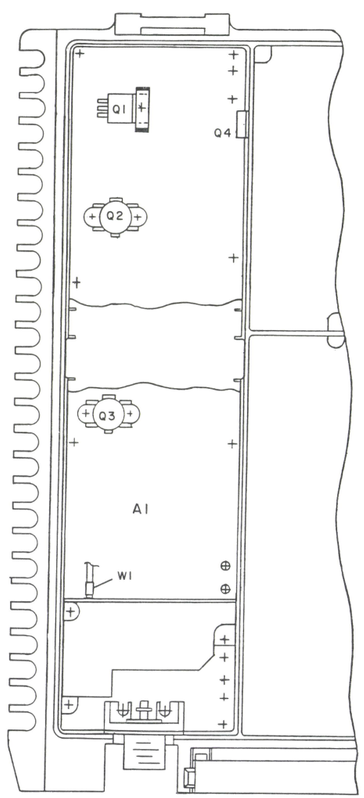
110-WATT PA



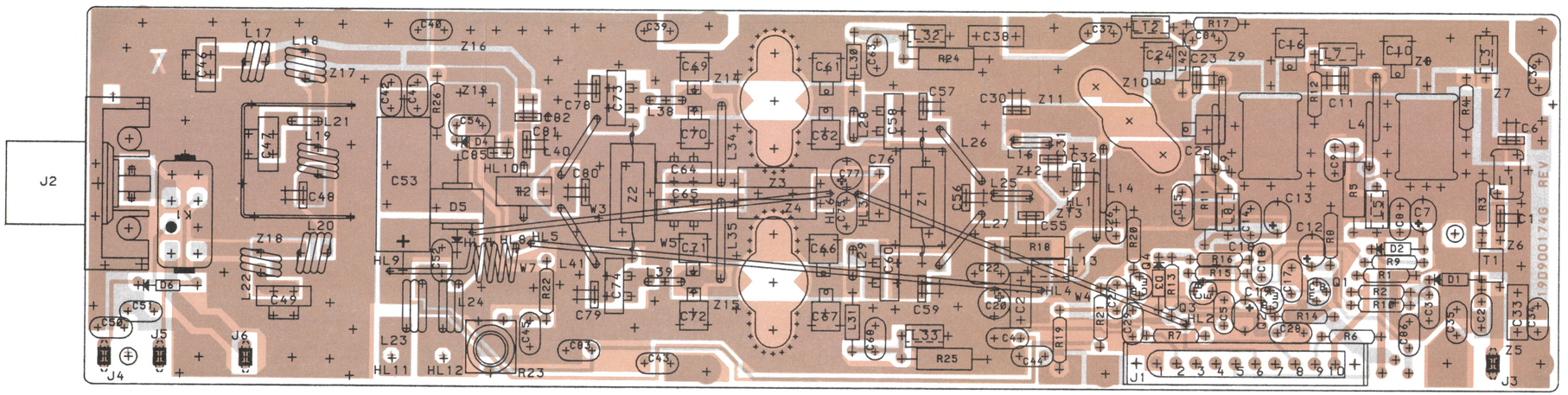
40- WATT PA



60-WATT PA



(19D900544, Rev. 1)



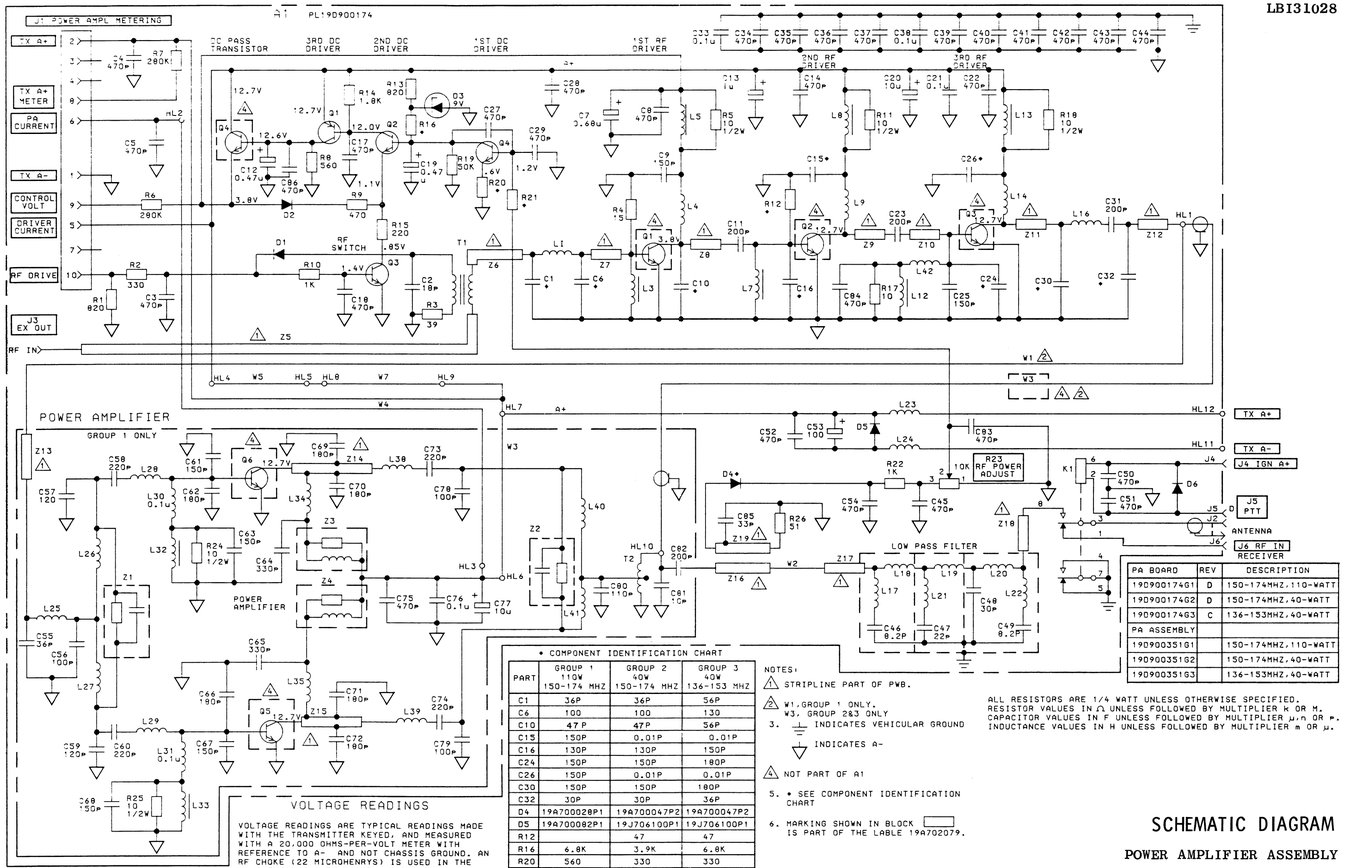
OUTLINE DIAGRAMS

POWER AMPLIFIER ASSEMBLY

4 Issue 5

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

(19D900380, Rev. 6)
(19A701398, Sh. 1, Rev. 7)
(19A701398, Sh. 2, Rev. 7)



PA BOARD	REV	DESCRIPTION
19D900174G1	D	150-174MHZ,110-WATT
19D900174G2	D	150-174MHZ,40-WATT
19D900174G3	C	136-153MHZ,40-WATT
PA ASSEMBLY		
19D900351G1		150-174MHZ,110-WATT
19D900351G2		150-174MHZ,40-WATT
19D900351G3		136-153MHZ,40-WATT

* COMPONENT IDENTIFICATION CHART

PART	GROUP 1 110W 150-174 MHZ	GROUP 2 40W 150-174 MHZ	GROUP 3 40W 136-153 MHZ
C1	36P	36P	56P
C6	100	100	130
C10	47 P	47P	56P
C15	150P	0.01P	0.01P
C16	130P	130P	150P
C24	150P	150P	180P
C26	150P	0.01P	0.01P
C30	150P	150P	180P
C32	30P	30P	36P
D4	19A700028P1	19A700047P2	19A700047P2
D5	19A700082P1	19J706100P1	19J706100P1
R12		47	47
R16	6.8K	3.9K	6.8K
R20	560	330	330
R21	10K	5.6K	5.6K

NOTES:
1. STRIPLINE PART OF PWB.
2. W1,GROUP 1 ONLY. W3, GROUP 2&3 ONLY
3. ⏚ INDICATES VEHICULAR GROUND
   ▽ INDICATES A-
4. NOT PART OF A1
5. * SEE COMPONENT IDENTIFICATION CHART
6. MARKING SHOWN IN BLOCK ▭ IS PART OF THE LABLE 19A702079.

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED.
RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER K OR M.
CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER µ,n OR p.
INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER m OR µ.

(19D900388, Rev. 6)

SCHEMATIC DIAGRAM

POWER AMPLIFIER ASSEMBLY

PARTS LIST

POWER AMPLIFIER ASSEMBLY

19D900351G1 150-174 MHz, 110 W
19D900351G2 150-174 MHz, 40 W
19D900351G3 132-153 MHz, 40 W
ISSUE 4

SYMBOL	GE PART NO.	DESCRIPTION
A1		POWER AMPLIFIER BOARD 19D900174G1 150-174 MHz, 110 W REV A 19D900174G2 150-174 MHz, 40 W REV A 19D900174G3 136-153 MHz, 40 W REV A
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A701413P22	Mica: 36 pF ±5%, 100 VDCW. (G1 & G2 only).
C1	19A701413P28	Mica: 56 pF ±5%, 100 VDCW. (G3 only).
C2	19A701624P314	Ceramic, disc: 18 pF ±5%, 500 VDCW, temp coef N220 PPM ±30.
C3 and C4	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C5	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap. (G1 only).
C6	19A701413P34	Mica: 100 pF ±5%, 100 VDCW. (G1 & G2 only).
C6	19A701413P37	Mica: 130 pF ±5%, 100 VDCW. (G3 only).
C7	315A6047P684U	Tantalum: .68 uF ±20%, 35 VDCW.
C8	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C9	19A701602P8	Ceramic: 150 pF ±10%, 1000 VDCW.
C10	19A700069P26	Mica: 47 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 & G2 only).
C10	19A700069P28	Mica: 56 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G3 only).
C11	19A701413P43	Mica: 200 pF ±5%, 100 VDCW.
C12	315A6047P474U	Tantalum: 0.47 uF ±20%, 35 VDCW.
C13	19A703314P6	Electrolytic: 1 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series.
C14	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C15	19A701602P8	Ceramic: 150 pF ±10%, 1000 VDCW. (G1 only).
C15	19A700121P2	Ceramic: 0.01 uF ±20%, 50 VDCW. (G2 & G3 only).
C16	19A700069P38	Mica: 150 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G3 only).
C16	19A700069P37	Mica: 130 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 & G2 only).
C17 and C18	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C19	315A6047P474U	Tantalum: 0.47 uF ±20%, 35 VDCW.
C20	19A703314P10	Electrolytic: 10 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series.
C21	19A700004P2	Metallized polyester: 0.1 uF ±10%, 63 VDCW.
C22	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C23	19A701413P43	Mica: 200 pF ±5%, 100 VDCW.
C24	19A700069P38	Mica: 150 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 & G2 only).
C24	19A700069P41	Mica: 180 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G3 only).
C25	19A700069P38	Mica: 150 pF ±5%, 100 VDCW; sim to Underwood 3H80020.
C26	19A701602P8	Ceramic: 150 pF ±10%, 1000 VDCW. (G1 only).
C26	19A700121P2	Ceramic: 0.01 uF ±20%, 50 VDCW. (G2 & G3 only).
C27 thru C29	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C30	19A701413P38	Mica: 150 pF ±5%, 100 VDCW. (G1 & G2 only).
C30	19A701413P41	Mica: 180 pF ±5%, 100 VDCW. (G3 only).
C31	19A701413P43	Mica: 200 pF ±5%, 100 VDCW.
C32	19A701413P20	Mica: 30 pF ±5%, 100 VDCW. (G1 & G2 only).
C32	19A701413P22	Mica: 36 pF ±5%, 100 VDCW. (G3 only).
C33	19A700004P2	Metallized polyester: 0.1 uF ±10%, 63 VDCW.
C34 thru C37	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C38	19A700004P2	Metallized polyester: 0.1 uF ±10%, 63 VDCW.
C39 thru C45	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C46	19A700015P3	Teflon/Mica: 8.2 pF ±5%, 250 VDCW.
C47	19A700015P12	Teflon/Mica: 22 pF ±5%, 250 VDCW.
C48	19A701413P20	Mica: 30 pF ±5%, 100 VDCW.
C49	19A700015P3	Teflon/Mica: 8.2 pF ±5%, 250 VDCW.
C50 thru C52	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C53	19A700064P4	Electrolytic: 100 uF, -10+150%, 250 VDCW.
C54	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C55	19A701413P22	Mica: 36 pF ±5%, 100 VDCW.
C56	19A701413P34	Mica: 100 pF ±5%, 100 VDCW. (G1 only).
C57	19A701413P36	Mica: 120 pF ±5%, 100 VDCW. (G1 only).
C58	19A700015P37	Teflon/Mica: 220 pF ±5%, 250 VDCW. (G1 only).
C59	19A701413P36	Mica: 120 pF ±5%, 100 VDCW. (G1 only).
C60	19A700015P37	Teflon/Mica: 220 pF ±5%, 250 VDCW. (G1 only).
C61	19A700069P38	Mica: 150 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 only).
C62	19A700069P41	Mica: 180 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 only).
C63	19A701602P8	Ceramic: 150 pF ±10%, 1000 VDCW. (G1 only).
C64 and C65	19A700015P41	Teflon/Mica: 330 pF ±5%, 250 VDCW. (G1 only).
C66	19A700069P41	Mica: 180 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 only).
C67	19A700069P38	Mica: 150 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 only).
C68	19A701602P8	Ceramic: 150 pF ±10%, 1000 VDCW. (G1 only).
C69 thru C72	19A700069P41	Mica: 180 pF ±5%, 100 VDCW; sim to Underwood 3H80020. (G1 only).
C73 and C74	19A700015P37	Teflon/Mica: 220 pF ±5%, 250 VDCW. (G1 only).
C75	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap. (G1 only).
C76	19A700004P2	Metallized polyester: 0.1 uF ±10%, 63 VDCW. (G1 only).
C77	19A703314P10	Electrolytic: 10 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series. (G1 only).
C78 and C79	19A701413P34	Mica: 100 pF ±5%, 100 VDCW. (G1 only).
C80	19A701413P35	Mica: 110 pF ±5%, 100 VDCW. (G1 only).
C81	19A701413P6	Mica: 10 pF ±5%, 100 VDCW. (G1 only).
C82	19A701413P43	Mica: 200 pF ±5%, 100 VDCW. (G1 only).
C83 and C84	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
C85	19A700219P46	Ceramic: 33 pF ±10%, 100 VDCW, temp coef 0 PPM. (G1 only).
C86	19A701602P13	Ceramic: 470 pF ±20%, 1000 VDCW; sim to Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
D1	19A700047P2	Silicon, 100 mW, continuous dissipation; sim to DO-15.
D2	19A700028P1	Silicon, fast recovery; fwd current 75 mA, 75 PIV; sim to Type 1N4148.
D3	19A700025P16	Silicon, zener: 400 mA max; sim to BZX55-C9V1.
D4	19A700028P1	Silicon, fast recovery; fwd current 75 mA, 75 PIV; sim to Type 1N4148. (G1 only).
D4	19A700047P2	Silicon, 100 mW, continuous dissipation; sim to DO-15. (G2 & G3 only).
D5	19A700082P1	Rectifier, silicon; sim to MR751. (G1 only).
D5	T324ADP1041	Rectifier, silicon; general purpose. (G2 & G3 only).
D6	T324ADP1041	Rectifier, silicon; general purpose.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1	19B80055G3	Connector: metering, block. Includes: (10) 19A700237P1 contacts.
J2	19A701854G1	Coax; sim to Amphenol 83-87601002.
J3 thru J6	19A701883P4	Contact, electrical; sim to AMP 86444-1. (Strip Form).
		- - - - - - - - - - RELAYS - - - - - - - - - -
K1	19A700061P1	Hermetic sealed: 180 to 341 ohms coil res, 8-16.3 VDC; sim to GE 3SAV1760A2, CP Clare HFH-1201558, or Potter-Brumfield HCM6160.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19J706085P1	Coil, choke: 0.822 uH ±30%; sim to Paul Smith LM-2.
L2		(Part of printed wire board 19D900175P1).
L3	19A701091G1	Coil.
L4	19A701848P1	Coil.
L5	19A701091G1	Coil.
L6		(Part of printed wire board 19D900175P1).
L7 and L8	19A701091G1	Coil.
L9	19A701848P1	Coil.
L10 and L11		(Part of printed wire board 19D900175P1).
L12 and L13	19A701091G1	Coil.
L14	19A701848P1	Coil.
L15		(Part of printed wire board 19D900175P1).
L16	19A702201P1	Coil.
L17	19A701418P3	Coil.
L18 thru L20	19A701419P3	Coil.
L21	19A701420P5	Coil.
L22	19A701418P3	Coil.
L23 and L24	19A701849P1	Coil.
L25	19A702201P1	Coil. (G1 only).
L26 and L27	19A701851P1	Coil. (G1 only).
L28 and L29	19A701420P3	Coil. (G1 only).
L30 and L31	19A700024P1	Coil, RF: 100 nH ±10%, 0.08 ohms DC res max, 100 v. (G1 only).
L32 and L33	19A701091G1	Coil. (G1 only).
L34 and L35	19A701852P1	Coil. (G1 only).
L36 and L37		(Part of printed board 19D900175P1).
L38 and L39	19A701420P4	Coil. (G1 only).
L40 and L41	19A701851P1	Coil. (G1 only).
L42	19A700024P1	Coil, RF: 100 nH ±10%, 0.08 ohms DC res max, 100 v.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A700020P1	Silicon: PNP, 500 mW; sim to BC558A.
Q2 thru Q4	19A700023P1	Silicon, NPN; sim to Type 2N3904.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	H212CRP182C	Deposited carbon: 820 ohms ±5%, 1/4 w.
R2	H212CRP133C	Deposited carbon: 330 ohms ±5%, 1/4 w.
R3	19A700106P29	Composition: 39 ohms ±5%, 1/4 w.
R4	19A700106P19	Composition: 15 ohms ±5%, 1/4 w.
R5	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R6 and R7	19A701250P444	Metal film: 280K ohms ±1%, 1/4 w.
R8	H212CRP156C	Deposited carbon: 560 ohms ±5%, 1/4 w.
R9	H212CRP174C	Deposited carbon: 470 ohms ±5%, 1/4 w.
R10	H212CRP210C	Deposited carbon: 1K ohms ±5%, 1/4 w.
R11	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R12	19A700106P31	Composition: 47 ohms ±5%, 1/4 w.
R13	H212CRP182C	Deposited carbon: 820 ohms ±5%, 1/4 w.
R14	H212CRP218C	Deposited carbon: 1.8K ohms ±5%, 1/4 w.
R15	H212CRP122C	Deposited carbon: 220 ohms ±5%, 1/4 w.
R16	H212CRP268C	Deposited carbon: 6.8K ohms ±5%, 1/4 w. (G1 & G3 only).
R16	H212CRP239C	Deposited carbon: 3.9K ohms ±5%, 1/4 w. (G2 only).
R17	19A700106P15	Composition: 10 ohms ±5%, 1/4 w.
R18	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R19	19A701864P2	Thermistor: 50K ohms ±10%; sim to Midwest Components 1H-503.
R20	H212CRP156C	Deposited carbon: 560 ohms ±5%, 1/4 w. (G1 only).
R20	H212CRP133C	Deposited carbon: 330 ohms ±5%, 1/4 w. (G2 & G3 only).
R21	H212CRP310C	Deposited carbon: 10K ohms ±5%, 1/4 w. (G1 only).
R21	H212CRP256C	Deposited carbon: 5.6K ohms ±5%, 1/4 w. (G2 & G3 only).
R22	H212CRP210C	Deposited carbon: 1K ohms ±5%, 1/4 w.
R23	19A700185P4	Variable: 10K ohms ±20%, 500 VDCW, 1/3 w.
R24 and R25	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R26	19A700106P32	Composition: 51 ohms ±5%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T1	19A702009G1	Transformer.
T2	19A701878G1	Transformer. (G1 only).
Z1 and Z2		- - - - - - - - - - NETWORKS - - - - - - - - - - NETWORK LOAD 19A702005G1 (G1 ONLY)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A700105P19	Mica: 27 pF ±5%, 500 VDCW.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A700111P24	Composition: 24 ohms ±5%, 750 VDCW.
Z3 and Z4		FILTER ASSEMBLY 19A701092G4 (G1 ONLY)
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A701091G2	Coil.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A700112P15	Composition: 10 ohms ±5%, 1 w.
Z5 thru Z19		(Part of printed board 19D900175P1).
A2	19A703218G1	Capacitor Assembly: ceramic, feed-thru, 1000 pF +100 -0% 500 VDCW.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A701891P1	Silicon, NPN. VHF Amplifier, 5 watt, 12.5 v.
Q2	19A701891P2	Silicon, NPN. VHF Amplifier, 15 watt, 12.5 v.
Q3	19A701889P1	Silicon, NPN, 12.5 v; sim to MRF-260.
Q4	19A700054P1	Silicon, NPN, 60 w; sim to BD-201.
Q5 and Q6	19A134387P1	Silicon, NPN. (G1 only).
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	19A701093P3	Strap. (G1 only).
W2	19A701093P3	Strap.
W3	19A702075G1	Semi Rigid Cable. (G2 & G3).
W3	19A701851P2	Coil. (G1).
W4	19A701093P3	Strap. (G2 & G3).
W4	19A701851P3	Coil. (G1).
W5	19A701851P4	Coil.
W7	19A701871P2	Coil.
		HANDLE LOCK ASSEMBLY 19D900534G1 LOW POWER 19D900349G2 HIGH POWER
	19B800004P5	Lock.
	19C850699P1	Lock support.
	19C850627P1	Handle.
	19A700132P818	Dowel pin. (Secures handle).
	19A701347P1	Lock pin. (Locks handle).
	19A700140P2	Compression spring. (Used with lock pin).
	19C850941P1	Slide lock. (Secures compression spring).
	19A702362P408	Machine screw: M3.5-.6 x 8. (Quantity 2).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19D900262P1	Low pass filter housing.
	19D900358P1	PA Cover.
	19A701706P1	Heat sink. (Used with Q1 & Q2).
	19A701983P1	Shield washer. (Used with Q1 & Q2).
	19A701093P4	Strap. (Used with Q1 & Q2).
	19A700115P3	Insulator, plate. (Used with Q1, Q2 & Q4).
	19A700068P1	Insulator, bushing. (Used with Q4).
	19A701368P1	Gasket. (Located under J2).
	19A704572P1	Metallic eyelet. (Located on C1 & C2 on A2).
	19A702381P525	Screw, thd. form: No. M3.5-0.6 x 25. (Secures Low Pass Filter casting).
	19A702381P510	Screw, thread forming: TORX DRIVE No. M3.5 - 0.6 x 10. (Secures antenna jack).
	19A702381P508	Screw, thd. form: No. 3.5-0.6 x 8. (Secures A2).
	19A702364P208	Machine screw, metric: 2.5-.45 x 10MM. (Secures Q1-Q6).
	19A701312P3	Flatwasher, metric: No. 2.5MM. (Secures Q4).
	19A700033P3	Lockwasher, external tooth: M2.5. (Secures Q4).
	19A700034P3	Hex nut, metric: M2.5 x 0.45. (Secures Q4).
	19A701400P2	Insulated spacer. (Quantity 4 - Located near A2 board).

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 - PA Board 19D900174G1-G3

Incorporated in initial shipment.

REV. B - To prevent RF interference from affecting pass transistor. Added C86.

Rev. C - To improve operation by changing to a more reliable capacitor. Changed C13, C20, and C77. Old part numbers were:
C13 - 19A701534P13; Tantalum: .68 uF ±20%, 35 VDCW
C20 and C77 - 19A701534P10; Tantalum: 10 uF ±20%, 25 VDCW

Rev. D - To improve operation. Changed C10 from 39 pF to 47 pF. Old part number was:
C10 - 19A700006P23; Mica: 39pF ±5% 100 VDCW

REV. A - 110 Watt Power Amplifier Board 19D900351G1

To facilitate manufacturing. Changed Q3, Q5 and Q6.
Previous Part Numbers were:
Q3 - 19A701889P1; Silicon, NPN, 12.5 v; sim to MRF-260.
Q5, Q6 - 19A700063P5 - Silicon, NPN, 12.5 v.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

This addendum describes revision letter changes that are not yet included in this publication.

REV. E PA BOARD 19D900174G2

To improve PA output power margin. Changed C32.

C32 is: 19A701413P22 mica; 36pF 5%, 100VDCW