MOBILE RADIO MAINTENANCE MANUAL

406—512 MHz POWER AMPLIFIER BOARD 19D423928G5, G6, G8

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DESCRIPTION

The PA assembly for CUSTOM MVP transmitters uses four RF power transistors to provide a power output of 35 Watts. The output power is adjustable using power control R213 and is type accepted with the FCC to operate over a range of 1-Watt to rated output power. A single transistor is used in the power control circuit.

Supply voltage (A+) for the PA is connected from J1 on the back of the radio through FL210-C5 on the side of the radio. C201, C202, and C203 prevent RF from getting on the power leads. Diode CR201 will cause the main fuse assembly to blow if the polarity of the power leads is reversed, providing reverse voltage protection for the radio.

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 (exciter output), power adjust voltage, driver, and PA current.

CIRCUIT ANALYSIS

RF POWER AMPLIFIERS

The exciter output is coupled through RF cable W201 to PA input jack J1. The 50 ohms RF input is coupled through a matching network comprised of C6, C7, C8 and W2 to the base of power amplifier Q1.

Part of the RF input is rectified by CR1 and metered at J5-4 through resistor R1.

Collector voltage for Q1 is applied direct from the DC power input through collector stabilizing network R5 and L2 and collector feed network L3 and C10.

The output of Q1 is coupled to the base of a second power amplifier Q202 through a matching network consisting of T1, C15 and C16.

Collector voltage to Q202 is controlled by power control circuit, Q215, and is applied through a collector stabilizing network L6 and R6 and collector feed network L5 and C18.

The output of Q202 is coupled to the base of driver Q203 through C17, C19 and a matching network consisting of T2, C22, C52, C24 and C25. The collector voltage to Q203 is coupled through collector stabilizing network L9 and R14 and collector feed network L8 and C26.

Collector current for Q203 is metered across tapped manganin resistor R12. The reading is taken in position F on the 1-Volt scale with the High Sensitivity button pressed, and read as 0-15 amperes full scale.

The output of driver Q203 is coupled through an impedance matching network (C26, C27, C29, C30, C33 and T3) that matches the output impedance of Q203 to the input impedance of power amplifier Q204 through a 50 ohm micro strip (W204) and input impedance matching network T4, C34, C35 and C36.

Collector current for Q204 is metered across tapped manganin resistor R10. The reading is taken in position G on the 1-Volt scale with the High Sensitivity button pressed and read as 0-15 amperes full scale.

Following power amplifier Q204 is a matching network C37, C38, and T5 that matches the output of Q204 to the 50-ohm input of low pass filter, through 50 ohm micro strip W5 and a 50 ohm cable W214. C1 on the low pass filter board provides DC isolation between the transmitter and the antenna.

The PA output is coupled through the low-pass filter to the antenna through antenna transfer relay K1.

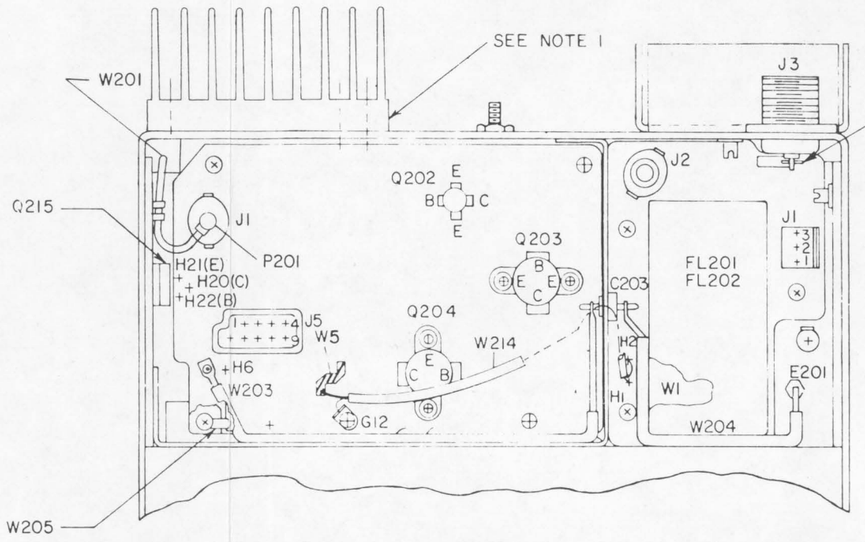
WARNING

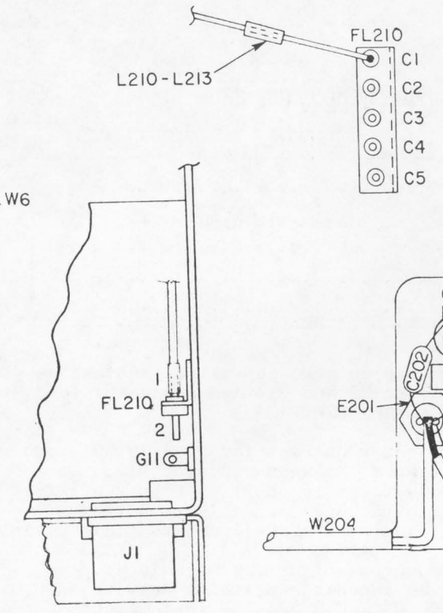
The RF Power Transistors used in the transmitter contain Beryllium Oxide, a TOXIC substance. If the ceramic, or other encapsulation is opened, crushed, broken or abraded, the dust may be hazardous if inhaled. Use care in replacing transistors of this type.

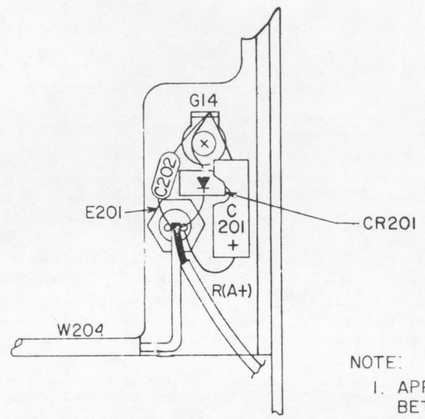
POWER CONTROL CIRCUIT

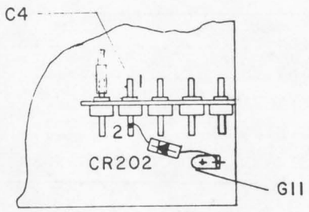
The power control circuit consists of R13 and Q215. R13 controls the base voltage, and conduction of Q215. Q215 is connected in series with the collector feed network for Q202 thereby controlling the drive to Q203 and therefore the output power. R13 is adjusted to provide the desired output power. The control voltage for Q202 is measured in position C on 1 volt scale and read as 0-15 volts full scale.

POWER AMPLIFIER ASSEMBLY





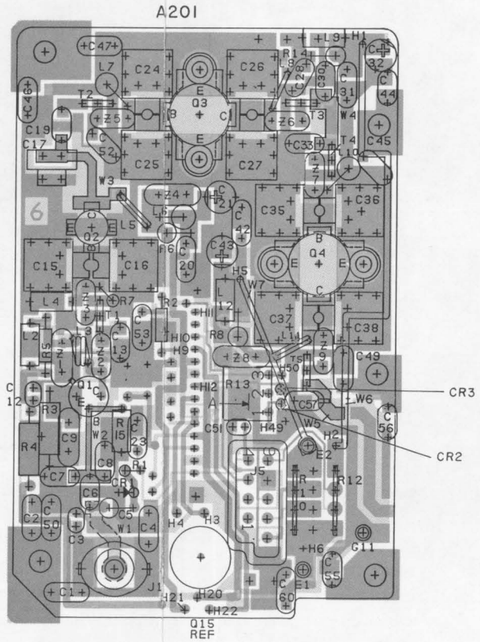




NOTE:
1. APPLY SILICONE GREASE (19A115205P3) BETWEEN CHASSIS AND HEAT SINK.

(19C327852, Rev. 3)

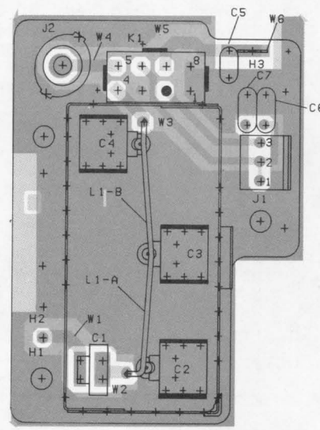
A201



(19C327156, Rev. 5)
(19B226633, Sh. 1, Rev. 6)
(19B226633, Sh. 2, Rev. 3)

PARTIAL REFERENCE DESIGNATIONS ARE SHOWN.FOR COMPLETE DESIGNATION, PREFIX WITH 200 SERIES.EXAMPLE: C1-C201, R1-R201, ETC.

FL201/FL202

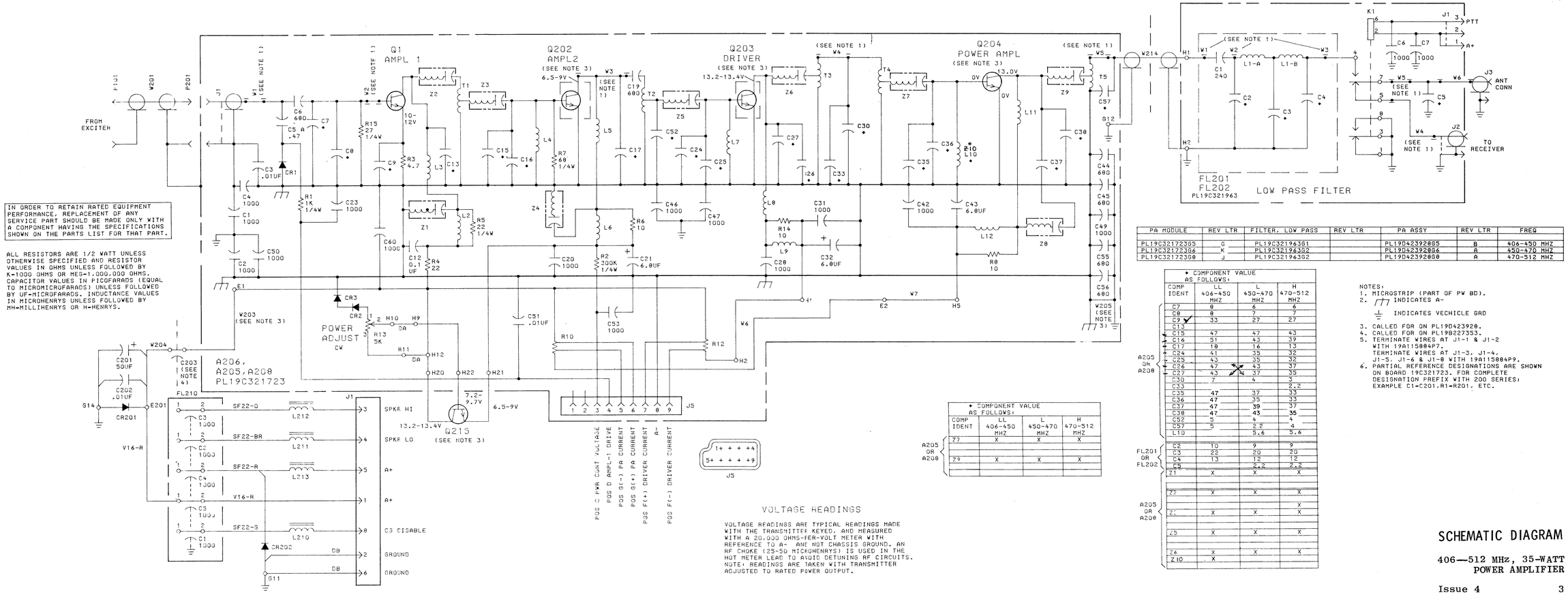


(19C327137, Rev. 2)
(19B227225, Sh. 2, Rev. 1)
(19B227225, Sh. 3, Rev. 0)

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

OUTLINE DIAGRAM

406—512 MHz, 35-WATT
POWER AMPLIFIER



PA MODULE	REV LTR	FILTER, LOW PASS	REV LTR	PA ASSY	REV LTR	FREQ
PL19C32172365	G	PL19C32196361		PL19D42392865	B	406-450 MHZ
PL19C32172366	K	PL19C32196362		PL19D42392866	A	450-470 MHZ
PL19C32172368	J	PL19C32196362		PL19D42392868	A	470-512 MHZ

◆ COMPONENT VALUE AS FOLLOWS:

COMP IDENT	LL 406-450 MHZ	L 450-470 MHZ	H 470-512 MHZ
C7	8	6	6
C8	8	7	7
C9 ✓	33	27	27
C13			
C15	47	47	43
C16	51	43	39
C17	18	16	13
C24	41	35	32
C25	43	35	32
C26	47	43	37
C27	43	37	35
C30	7	4	3
C33			2.2
C35	47	37	33
C36	47	35	33
C37	47	39	37
C38	47	43	35
C52	5	4	4
C57	5	2.2	4
L10		5.6	5.6
C2	10	9	9
C3	22	20	20
C4	13	12	12
C5		2.2	2.2
Z1	X	X	X
Z2	X	X	X
Z3			X
Z5	X	X	X
Z6	X	X	X
Z10	X		

A205 OR A208 — FL201 OR FL202 — A205 OR A208

◆ COMPONENT VALUE AS FOLLOWS:

COMP IDENT	LL 406-450 MHZ	L 450-470 MHZ	H 470-512 MHZ
Z7	X	X	X
Z9	X	X	X

A205 OR A208

NOTES:
1. MICROSTRIP (PART OF PW BD).
2. ✓ INDICATES A-
   ⏚ INDICATES VECHICLE GRD
3. CALLED FOR ON PL19D423928.
4. CALLED FOR ON PL19B227353.
5. TERMINATE WIRES AT J1-1 & J1-2 WITH 19A115884P7.
   TERMINATE WIRES AT J1-3, J1-4, J1-5, J1-6 & J1-8 WITH 19A115884P9.
6. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN ON BOARD 19C321723. FOR COMPLETE DESIGNATION PREFIX WITH 200 SERIES; EXAMPLE C1=C201,R1=R201, ETC.

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. NOTE: READINGS ARE TAKEN WITH TRANSMITTER ADJUSTED TO RATED POWER OUTPUT.

SCHEMATIC DIAGRAM

406—512 MHz, 35-WATT POWER AMPLIFIER

Issue 4

(19B622308, Rev. 13)

PARTS LIST

LBI30585D

406-512 MHz 35 WATT POWER AMPLIFIER
19D423928G5 450-470 MHz
19D423928G6 430-470 MHz
19D423928G8 470-512 MHz

SYMBOL	GE PART NO.	DESCRIPTION
A200, A206, A208		POWER AMPLIFIER MODULE A200 19C321723G5 406-450 MHz A206 19C321723G6 450-470 MHz A208 19C321723G8 470-512 MHz
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C201 and C202	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C203	19A116192P1	Ceramic: 0.01 µF ±20%, 50 VDCW; sim to Erie 8121 SPECIAL.
C204	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C205	19A700013P9	Phenolic: 0.47 pF ±5%, 500 VDCW.
C206	19A116655P18	Ceramic disc: 680 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C207LL and C207N	19A116656P8J0	Ceramic disc: 8 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C208LL and C208N	19A116656P8J0	Ceramic disc: 8 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C209LL* and C209N	19A116656P7J0	Ceramic disc: 7 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
		In KEY F & earlier:
	19A116656P6J0	Ceramic disc: 6 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
		In KEY H & earlier:
	19A116656P6J0	Ceramic disc: 6 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C209LL* and C209N	19A116655P33J0	Ceramic mica: 33 pF ±5%, 500 VDCW; temp coef 0 PPM.
C209L	19A116656P27J0	Ceramic mica: 27 pF ±5%, 500 VDCW, temp coef 0 PPM.
C209N	19A116656P27J0	Ceramic mica: 27 pF ±5%, 500 VDCW; temp coef 0 PPM.
C210LL* and C210N*	19A134666P3	Silver mica: 27 pF ±5%, 500 VDCW; sim to Electro Motive Type DM15AC0. Deleted by KEY F.
C210L* and C210N*	19A134666P1	Silver mica: 18 pF ±5%, 500 VDCW; sim to Electro Motive Type DM15AC8. Deleted in G8 by KEY H. Deleted in G8 by KEY G.
C211LL*	19A116655P33J0	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted by KEY F.
C211L* and C211N*	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C212	19A116192P1	Ceramic: 0.01 µF ±20%, 50 VDCW; sim to Erie 8121 SPECIAL.
C213*	19A116656P4J0	Ceramic disc: 4 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM. Deleted by KEY G.
C214LL*	19A116655P33J0	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted by KEY F.
C214L* and C214N*	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C215LL and C215L	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW.
C215N	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW.
C216LL	19A116952P51	Metallized teflon: 51 pF ±2%, 250 VDCW.
C216L	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW.
C216N	19A116952P39	Metallized teflon: 39 pF ±2%, 250 VDCW.
C217LL	19A116679P18D	Metallized teflon: 18 pF ±.5 pF, 250 VDCW.
C217L	19A116679P16D	Metallized teflon: 16 pF ±.5 pF, 250 VDCW.
C217N	19A116679P13D	Metallized teflon: 13 pF ±.5 pF, 250 VDCW.
C218*	19A134666P1	Silver mica: 18 pF ±5%, 500 VDCW; sim to Electro Motive Type DM15AC8. Deleted in G5 by KEY F. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C219	19A116655P18	Ceramic disc: 680 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C220	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C221	19A134202P15	Tantalum: 6.8 µF ±20%, 35 VDCW.
C222LL* and C222N*	19A116656P32J0	Ceramic disc: 32 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted by KEY F.
C222L* and C222N*	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C223	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C224LL	19A116952P41	Metallized teflon: 41 pF ±2%, 250 VDCW.
C224L	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW.
C224N	19A116952P32	Metallized teflon: 32 pF ±2%, 250 VDCW.
C225LL	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW.
C225L	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW.
C225N	19A116952P32	Metallized teflon: 32 pF ±2%, 250 VDCW.
C226LL	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW.
C226L	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW.
C226N	19A116952P37	Metallized teflon: 37 pF ±2%, 250 VDCW.
C227LL	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW.
C227L	19A116952P37	Metallized teflon: 37 pF ±2%, 250 VDCW.
C227N	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW.
C228	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C229LL*	19A116655P33J0	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted by KEY F.
C229L* and C230N*	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C230LL*	19A116656P7J0	Ceramic disc: 7 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
		In KEY F & earlier:
	19A116656P6J0	Ceramic disc: 6 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C230L*	19A116656P4J0	Ceramic disc: 4 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C230N	19A116655P30	Ceramic disc: 3 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C231	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C232	19A134202P15	Tantalum: 6.8 µF ±20%, 35 VDCW.
C233N	19A134100P50	Ceramic disc: 2.2 pF ±0.1 pF, 100 VDCW, temp coef 0 ±120PPM/°C.
C234LL*	19A116655P33J0	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted by KEY F.
C234L* and C234N*	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C235LL*	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		In KEY F & earlier:
	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C235L	19A116952P37	Metallized teflon: 37 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C235N	19A116952P33	Metallized teflon: 33 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C236LL*	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		In KEY F & earlier:
	19A116952P39	Metallized teflon: 39 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C236L	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C236N	19A116952P33	Metallized teflon: 33 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C237LL*	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		In KEY H & earlier:
	19A116952P39	Metallized teflon: 39 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C237L*	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C237N	19A116952P33	Metallized teflon: 33 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C238LL*	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		In KEY K & F:
	19A116952P51	Metallized teflon: 51 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
		In KEY D & earlier:
	19A116952P47	Metallized teflon: 47 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C238L*	19A116952P43	Metallized teflon: 43 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C238N*	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		In KEY E-G:
	19A116952P39	Metallized teflon: 39 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
		In KEY D & earlier:
	19A116952P35	Metallized teflon: 35 pF ±2%, 250 VDCW; sim to Underwood Type JIRF.
C239*	19A116666P1	Silver mica: 18 pF ±5%, 500 VDCW; sim to Electro Motive Type DM15AC8. Deleted in G5 by KEY F. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C240LL*	19A116656P33J0	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted by KEY F.
C240L* and C240N*	19A116656P24J0	Ceramic disc: 24 pF ±5%, 500 VDCW, temp coef 0 PPM. Deleted in G6 by KEY H. Deleted in G8 by KEY G.
C242	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C243	19A134202P15	Tantalum: 6.8 µF ±20%, 35 VDCW.
C244 and C245	19A116655P18	Ceramic disc: 680 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C246 and C247	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C249 and C250	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C251	19A116192P1	Ceramic: 0.01 µF ±20%, 50 VDCW; sim to Erie 8121 SPECIAL.
C252LL	19A116656P5J0	Ceramic disc: 5 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C252L and C252N	19A116656P4J0	Ceramic disc: 4 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C253	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C255 and C256	19A116655P18	Ceramic disc: 680 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C257LL	19A116656P5J0	Ceramic disc: 5 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C257L*	19A116656P4J0	Ceramic disc: 4 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
		In KEY H & earlier:
	19A134100P20	Ceramic disc: 2.2 pF ±0.1 pF, 100 VDCW.
C260	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR201 and CR202	19A116082P1	Diode, hot carrier: Fwd. drop .350 V. max.
CR203 and CR204	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1 and E2	19A134263P1	Contact, electrical; sim to Selectro A-L-070174-1.
G11	19A134263P1	Contact, electrical; sim to Selectro A-L-070174-1.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J201	19A130924G1	Connector, coaxial: jack type; sim to Cinch 14H1163.
J205	19B219374G1	Connector: 9 contacts.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L202	19A129773G1	Coil.
L203	19A129774P1	Coil.
L204	19A129773G1	Coil.
L205	19B219457P6	Coil.
L206	19A700000P120	Choke, RF: 5.6 µh ±10%, 0.13 ohms DC res max.
L207	19A700000P50	Choke, RF: 5.6 µh ±10%, 0.28 ohms DC res max.
L208LL and L208N	19B219457P5	Coil.
L208L and L208H	19A130650P1	Coil.
L209	19A129773G1	Coil.
L210LL*	19A700000P25	Choke, RF: 15.0 µh ±10%, 1.20 ohms DC res max. Deleted by KEY G.
L210L and L210H	19A700000P20	Choke, RF: 5.6 µh ±10%, 0.28 ohms DC res max.
L211	19B219457P6	Coil.
L212	19A129773G1	Coil.
		- - - - - - - - TRANSISTORS - - - - - - - -
Q201	19A134237P1	Silicon, NPN.
		- - - - - - - - RESISTORS - - - - - - - -
R201	19A700100P63	Composition: 1K ohms ±5%, 1/8 w.
R202	3R152P304J	Composition: 300K ohms ±5%, 1/4 w.
R203	19A700113P7	Composition: 4.7 ohms ±5%, 1/2 w.
R204	19A700113P23	Composition: 22 ohms ±5%, 1/2 w.
R205	19A700100P23	Composition: 22 ohms ±5%, 1/4 w.
R206	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R207	19A700100P35	Composition: 68 ohms ±5%, 1/4 w.
R208	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R210	19C302012P1	Shunt resistor.
R212	19C302012P1	Shunt resistor.
R213	19A116559P102	Variable, cermet: 5K ohms ±20%, .5 w; sim to CTS Series 360.
R214	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R215	19A700106P25	Composition: 27 ohms ±5%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T201 thru T206	19A130446G1	Coil.
		- - - - - - - - - - CABLES - - - - - - - - - -
W201 thru W204		(Part of printed board 19D423005P1).
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E201	7143206P1	Terminal, standoff.
W207	19A130791G1	Jumper.
		- - - - - - - - - - NETWORKS - - - - - - - - - -
Z201LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z201L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z201N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z202LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z202L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z202N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z203LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z203L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z203N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z204*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added to G5 by KEY F. Added to G6 by KEY H. Added to G8 by KEY G.
Z205LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z205L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z205N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z206LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z206L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z206N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z207LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z207L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z207N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z208*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added to G5 by KEY F. Added to G6 by KEY H. Added to G8 by KEY G.
Z209LL*	19A134666P3	Network, Freq. Selective; sim to Dilectron TC501: NPO:330:SLAC. Added by KEY F.
Z209L*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY H.
Z209N*	19A134666P1	Network, Freq. Selective; sim to Dilectron TC501: NPO:240:SLAC. Added by KEY G.
Z210*	19A134581G1	Network. Added by KEY G. Includes:
L1	19A700024P1	Coil, RF: 100 nH ±5%, 0.08 ohms DC res max.
L2	19A129773G1	Coil.
R1	19A700100P15	Resistor, composition: 10 ohms ±5%, 1/4 w.
C201	19A115680P4	- - - - - - - - - - CAPACITORS - - - - - - - - - - Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TTX.
C202	19A116080P101	Polyester: 0.01 µf ±10%, 50 VDCW.
C203	19B209488P2	Ceramic, feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Style FASD.
		- - - - - - - - - - DIODES AND RECTIFIERS - - - - - - - - - -
CR201	19A116783P1	Silicon, 100 VDC blocking, 6 amps.
CR202	4037822P1	Silicon, 1000 ma, 400 PIV.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E201	7143206P1	Terminal, standoff.
FL201 and FL202		- - - - - - - - - - FILTERS - - - - - - - - - - FILTER BOARD FL201 19C321983G1 406-450 MHz (L) FL202 19C321983G2 450-512 MHz (H)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A700015P38	Teflon/mica: 240 pf ±5%, 250 VDCW.
C2LL	19A700014P4	Teflon/mica: 10 pf ±5%, 250 VDCW.
C2H	19A116952P9	Metallized teflon: 9 pf ±0.5 pf, 250 VDCW.
C2LL	19A116952P22	Metallized teflon: 22 pf ±0.5 pf, 250 VDCW.
C3H	19A116952P20	Metallized teflon: 20 pf ±0.5 pf, 250 VDCW.
C4LL	19A116952P13	Metallized teflon: 13 pf ±0.5 pf, 250 VDCW.
C4H	19A116952P12	Metallized teflon: 12 pf ±0.5 pf, 250 VDCW.
C5H	19A134100P20	Ceramic: 2.2 pf ±0.1 pf, 100 VDCW.
C6 and C7	19A116655P20	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1	19A116659P55	Connector, printed wiring: 3 contacts; sim to Molex 09-50-1031.
J2	19A130924G1	Connector, coaxial: jack type; sim to Cinch 14H1163.
		- - - - - - - - - - RELAYS - - - - - - - - - -
K1	19A700061P1	Hermetic sealed: 180-3x1 ohms coil res, #16-3 VDC; sim to GE 3SAV176042 or Potter-Brasfield HCM8160.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1LL	19B227240P1	Jumper.
L1H	19B227240P2	Jumper.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1 thru W5		(Part of printed board 19C321962P1).
W6	19A136512P1	Antenna strap.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL210		FILTER 19A136680G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 thru C3	5493392P7	Ceramic, feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FASC.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
G11 and G12	7135118P2	Terminal, solderless.
G14	7135118P2	Terminal, solderless.
J1		- - - - - - - - - - JACKS AND RECEPTACLES - - - - - - - - - - Connector. Includes:
	19A116884P12	Shell.
	19A115884P7	Contacts, male: wire size 14-20; sim to AMP 60526-1. Incorporated in initial shipment.
	19A115884P9	Contacts, male: wire size 22-30; sim to AMP 60910-1. Incorporated in initial shipment.
J3	19A700067P1	Connector, receptacle: coaxial; sim to amphenol 83-79R. Increase Power Output. Changed C237LL and C238LL.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L210 thru L213	19A126416P3	Core, toroidal, ferrite: sim to Stackpole #8-31809.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P201		(Part of W201).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q202	19A134164P2	Silicon, NPN; sim to Type 2N5945.
Q203C	19A134232P3	Silicon, NPN. (406-450 MHz)
Q203H	19A134232P1	Silicon, NPN. (450-512 MHz) To incorporate frequency selective networks. Replaced C10, C11, C14, C18, C22, C24, C34, C39 and C40 with 21 through 29.
Q204	19A134243P1	Silicon, NPN.
Q215	19A116743P1	Silicon, NPN.
		- - - - - - - - - - CABLES - - - - - - - - - -
W201*	19A133930G1	Cable, RF: approx 7-1/2 inches long. Earlier than KEY A:
	5491689P91	Cable, RF: approx 7-1/2 inches long.
W203	19C327146G1	Jumper.
W204	19C327146G2	Jumper.
W205	7135118P1	Terminal, solder.
W214	19A130831C2	Cable: approx 5-1/4 inches long.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19C327846C1	Heat sink, finned.
	19C321441P1	Insulator. (Located under A205 & A206, A208).
	19B227353C1	Shield. (Located around A205, A206, A208).
	19B201074P304	Tap screw, Phillips PGSDIR1/8®. No. 6-32 x 1/4. (Secures shield to frame at C17).
	19B201074P305	Tap screw, Phillips PGSDIR1/8®. No. 6-32 x 5/16. (Secures shield to frame at J3).
	5492178P2	Washer, spring tension. (Used with Q202).
	8207P15C6	Hex nut: No. 8-32. (Used with Q202).
	19A130465P1	Spacer. (Used with Q202).
	364P9006C6	Screw, machine: No. 4-40 x 3/8. (Secures Q203).
	19A116023P1	Insulator, plate. Dupont No. 300 Easton R. (Located under Q215).
	19A134016P1	Insulator, bushing. (Used with Q215).
	7878243P11	Hex nut: No. 8-32. (Secures stud that mates with wing nut securing radio to case).
	4033714P11	Terminal, solderless: sim to Zierick 349. (Solders to FL201 & FL202).
	384P13000C6	Tap screw, Phillips Pozidriv®: No. 6-32 x 3/16. (Secures FL210).
	19B201074P206	Tap screw, Phillips PGSDIR1/8®: No. 4-40 x 1/4. (Secures J1).
	4036555P1	Insulator, washer: nylon. (Used with Q201 on PA Module).
	19B219554G2	Can. (FL201, FL202).
	19B219555P1	Cover. (FL201, FL202).
	19B209502P1	Terminal, stud. (Used with C2, C3, C4).
	19A116617P6	Bumper, plastic. (Quantity 4).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

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 - D - Power Amplifier Module 19C321723G5, 6, 8

REV. E - Power Amplifier Module 19C321723G6
Incorporated in initial shipment.

REV. E - Power Amplifier Module 19C321723G5
Increase Power output. Changed C237LL and C238LL.

REV. E - Power Amplifier Module 19C321723G8
Increase Power output. Changed C237N and C238N.

REV. F - Power Amplifier Module 19C321723G6
To improve operation. Changed C209L.

REV. F - Power Amplifier Module 19C321723G8

REV. G - Power Amplifier Module 19C321723G6
To input VSWR. Changed C208L and C208N.

REV. A - Power Amplifier Assembly 19D423928G5, G6, G8
To reduce power fluctuations when cable is re-positioned. Changed W201.

REV. F - Power Amplifier Module 19C321723G5

REV. H - Power Amplifier Module 19C321723G6

REV. G - Power Amplifier Module 19C321723G5
To incorporate frequency selective networks. Replaced C10, C11, C14, C18, C22, C24, C34, C39 and C40 with 21 through 29.

REV. J - Power Amplifier Module 19C321723G6
To increase power output in 450-512 MHz range. Changed C237L, C238L and C238N.

REV. H - Power Amplifier Module 19C321723G8
To increase power output in 450-512 MHz range. Changed C237N, C238N and C238L.

REV. G - Power Amplifier Module 19C321723G5
To increase power output in 406-450 MHz range. Deleted C213 and C210LL. Changed C230LL, C231LL, C236LL, C237LL, C238LL and added Z210LL.

REV. B - Power Amplifier Assembly 19D423928G5
To increase power output in 406-450 MHz range. Changed Q203C.

REV. K - Power Amplifier Module 19C321723G6
To increase power output in 450-470 MHz range. Added C257N.

REV. J - Power Amplifier Module 19C321723G8
To increase power output in 470-512 MHz range. Changed C257N.