MOBILE RADIO

MAINTENANCE MANUAL

138—174 MHz, 60-WATT POWER AMPLIFIER 19D424089G1 & G2

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DESCRIPTION

The PA assembly for MASTR®Executive II 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 power leads from the system-audio-squelch board (SAS) to 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 radio.

The PA assembly is DC isolated from vehicle ground 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.

The hinged PA heat sink pivots 90° to provide access to the power amplifier board, low pass filter and centralized metering jack.

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), Ampl-1, Driver and PA current.

CIRCUIT ANALYSIS

PA DRIVER (A201)

The exciter 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 at 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 Sensitivity 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 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 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.

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WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

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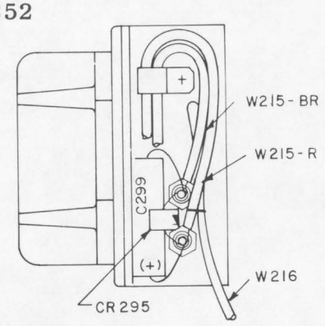
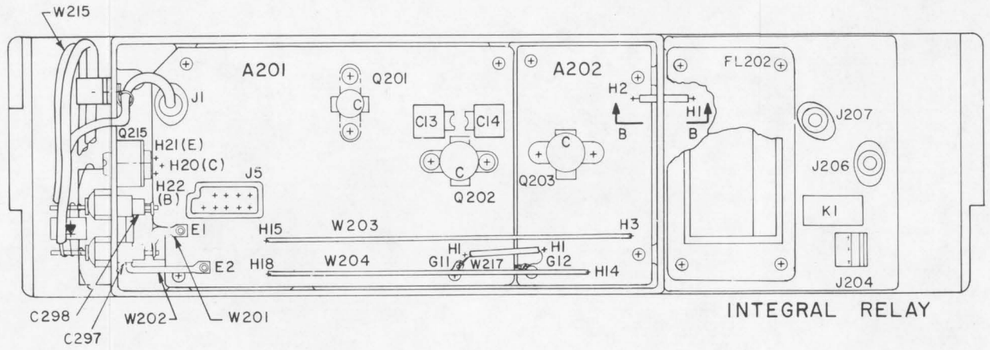
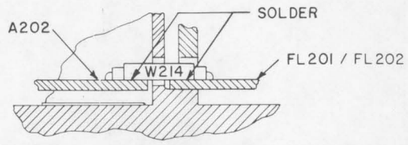
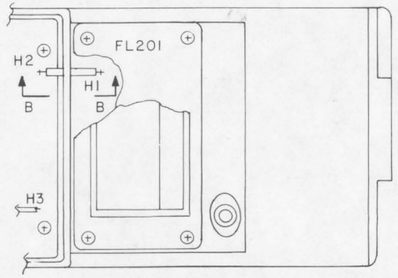




INTEGRAL RELAY



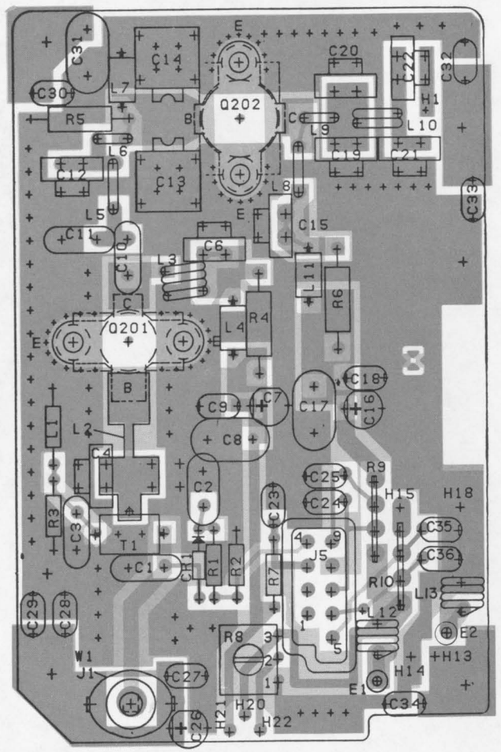
SECT B-B



EXTERNAL RELAY

A201

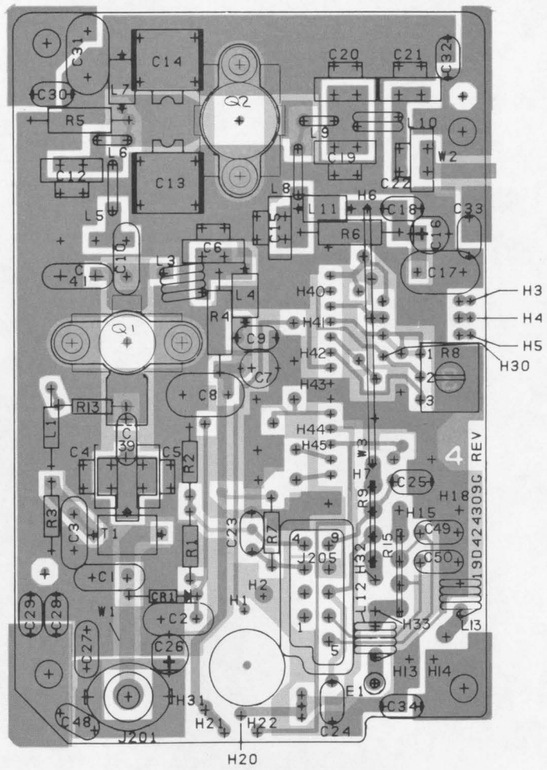
PA BOARD 19D423719G2



(19C327622, Rev. 0)
(19B227232, Sh. 1, Rev. 3)
(19B227232, Sh. 2, Rev. 3)

A201

PA BOARD 19D424309G5



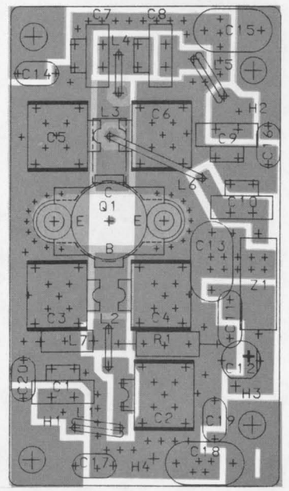
(19C330469, Rev. 1)
(19B227634, Sh. 1, Rev. 4)
(19B227634, Sh. 2, Rev. 3)

(19D424576, Rev. 2)

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

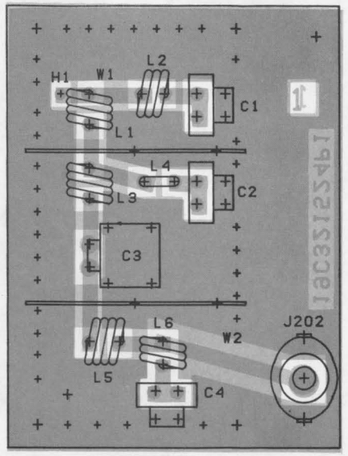
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

A202



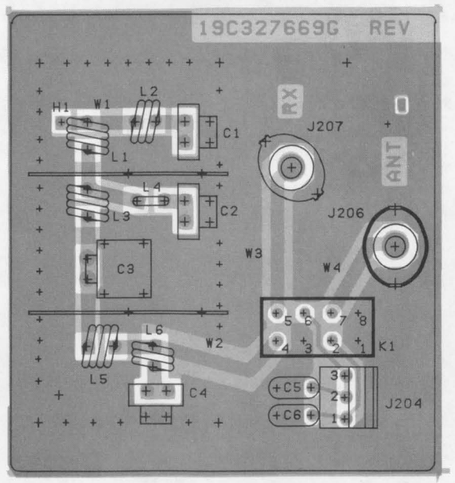
(19C327373, Rev. 2)
(19B227346, Sh. 2, Rev. 1)
(19B227346, Sh. 3, Rev. 1)

FL201 EXTERNAL RELAY



(19C327367, Rev. 1)
(19B226795, Sh. 2, Rev. 1)
(19B226795, Sh. 3, Rev. 1)

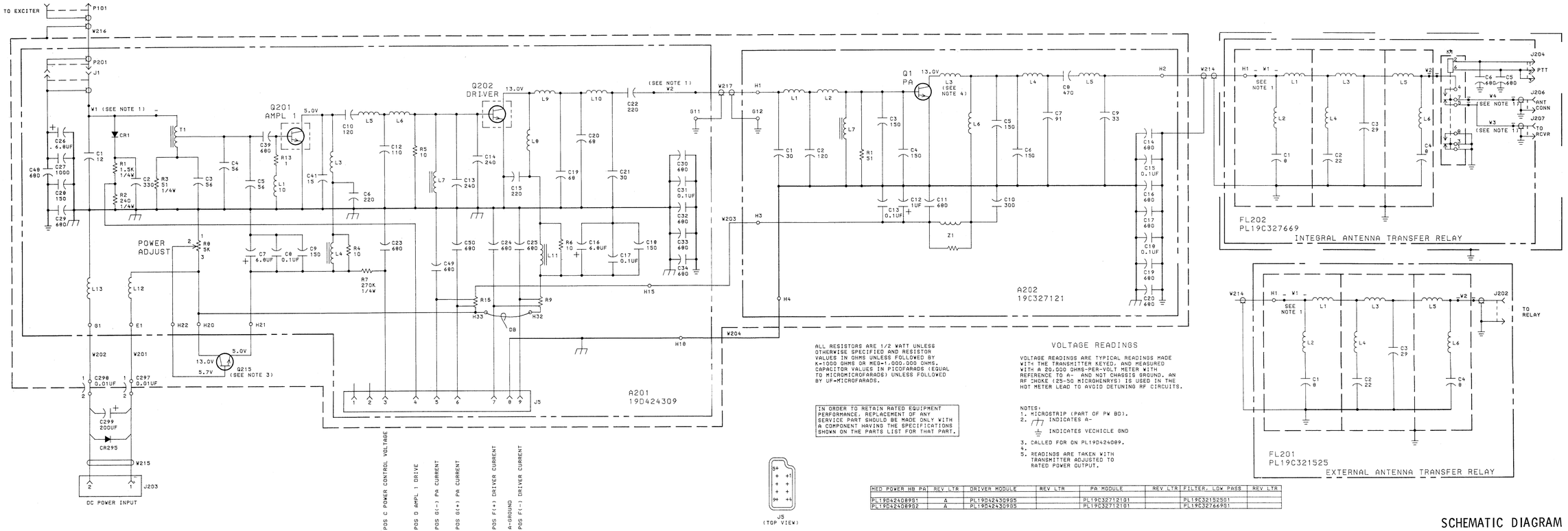
FL202 INTEGRAL RELAY



(19C327916, Rev. 0)
(19B227884, Sh. 2, Rev. 0)
(19B227884, Sh. 3, Rev. 0)

OUTLINE DIAGRAM

138—174 MHz,
60 WATT POWER AMPLIFIER



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
PL19D424089S1	A	PL19D424309S		PL19C327121S1		PL19C321525S1	
PL19D424089S2	A	PL19D424309S		PL19C327121S1		PL19C327669S1	

(19B622428, Rev. 1)

SCHEMATIC DIAGRAM

138—174 MHz, 60 WATT POWER AMPLIFIER

PARTS LIST

132-174 MHz, 60 WATT
POWER AMPLIFIER
19D424089G1 EXTERNAL RELAY
19D424089G2 INTEGRAL RELAY

SYMBOL	GE PART NO.	DESCRIPTION
A201		PA MODULE 19D424309G5
		- - - - - - - - - - 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: 53 pf ±5%, 500 VDCW.
C4A and C5A	19A700015P23	Metallized teflon: 56 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 VDC*.
C9	19A116655P8	Ceramic disc: 150 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C10B	19A700105P36	Mica: 120 pf ±5%, 500 VDCW.
C12	19A700015P30	Metallized teflon: 110 pf ±5%, 250 VDCW.
C13B and 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	Metallized teflon: 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.

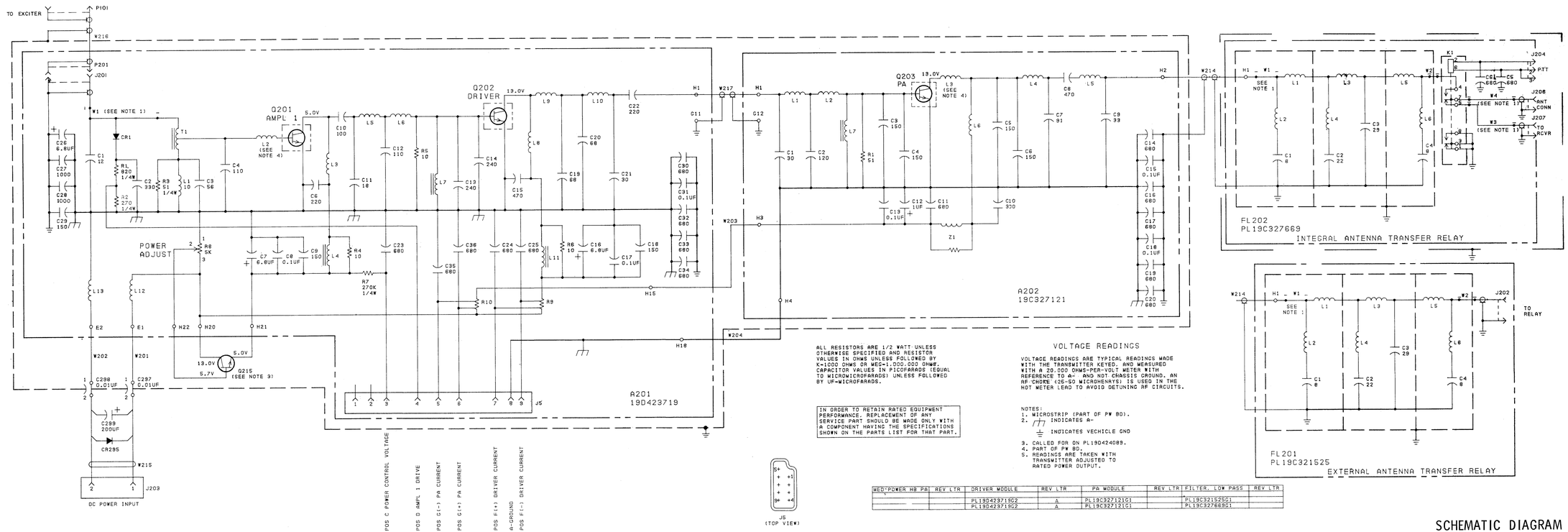
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1	19A134263P1	Contact, electrical: sim to Selectro X-L-070174-1.
G1	19A134263P1	Contact, electrical: sim to Selectro X-L-070174-1.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J201	19A130924G1	Connector, coaxial: jack type; sim to Cinch 14H11613.
J205	19B219374G1	Connector: 9 contacts.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19B209420P125	Coil, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4K.
L3A	19A136530P1	Coil.
L4	19A129773G1	Coil.
L5B	19A136532P1	Coil.
L6	19A129575P1	Coil.
L7	19A129773G1	Coil.
L8B	19A136531P1	Coil.
L9B	19A129575P1	Coil.
L10B	19A136533P1	Coil.
L11	19A129773G1	Coil.
L12 and L13	19A129569P1	Coil.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A700106P67	Composition: 820 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	Composition: 10 ohms ±5%, 1/2 w.
R5B	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R6	19A700113P15	Composition: 10 ohms ±5%, 1/2 w.
R7	3R152P274J	Composition: 270K ohms ±5%, 1/4 w.
R8B	19A116559P102	Variable, cermet: 5000 ohms ±20%, .5 w; sim to CTS Series 360.
R9	19C320212P2	Shunt resistor.
R13	19A116216P1R0J	Deposited carbon: 1 ohm ±5%, 1/5 w; sim to Mepco/Electra Type CR25.
R15	19C320212P2	Shunt resistor.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T1	19A129564G1	Transformer.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1 and W2		(Part of printed board 19D424308P1).
W3	19B227912P1	Jumper.
A202		PA BOARD 19C327121G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A700015P16	Metallized teflon: 30 pf ±5%, 250 VDCW.
C2	19A116795P120J	Silver mica: 120 pf ±5%, 250 VDCW; sim to Underwood Type J1HF.
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.

SYMBOL	GE PART NO.	DESCRIPTION
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.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A700113P32	Composition: 51 ohms ±5%, 1/2 w.
		- - - - - - - - - - NETWORKS - - - - - - - - - -
Z1		FILTER ASSEMBLY 19B219949G1
		- - - - - - - - - - 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 - - - - - - - - - -
FL201		COMPONENT BOARD 19C321525G1
		- - - - - - - - - - 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.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J202	19A130924G1	Connector, receptacle: jack type; sim to Cinch 14H11313.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A129569P1	Coil.
L2	19A129570P1	Coil.
L3	19A129569P1	Coil.
L4	19A129575P1	Coil.
L5	19A129569P1	Coil.
L6	19A129570P1	Coil.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1 and W2		(Part of printed board 19C321524P1).
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	19B209558P1	Hermetic sealed: 180 to 341 ohms coil res, 2 form C contacts, 8.0 to 16.3 VDC; sim to GE 3SAV1760A2.
		- - - - - - - - - - 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.
Q215	19A116742P1	Silicon, NPN.
		- - - - - - - - - - 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.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19C321591G4	Heat sink.
	19D416275P3	Filter housing. (FL201).
	19C327282P1	Insulator. (Used with W214).
	N44P9006C6	Machine screw: No. 4-40 x 3/8. (Secures Q1, Q201, Q202).
	19A130568P1	Plate. (Used with Q215).
	19A116023P1	Insulator, plate. (Used with Q215).
	19A134016P1	Insulator, bushing. (Used with Q215).
	4029851P6	Clip loop. (Secures W215).
	7878455P2	Solderless terminal. (Used with W217).
	19B201074P305	Tap screw, Phillips POZIDRIV®: No. 6-32 x 5/16. (Secures A201).
	19A129434P1	Washer. (Used with C297, C298).
	19B201074P312	Tap screw, Phillips POZIDRIV®: No. 6-32 x 3/4. (Secures FL201 can).
	19B226952G1	P.A. Cover.
	19A129361P2	Shield. (Located on FL201 & FL202).
	7139898P3	Nut, hex, brass: 1/4-28. (Used with C297 & C298).



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 (26-50 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. PART OF PW BD.
5. READINGS ARE TAKEN WITH TRANSMITTER ADJUSTED TO RATED POWER OUTPUT.

MED-POWER HB PA	REV LTR	DRIVER MODULE	REV LTR	PA MODULE	REV LTR	FILTER, LOW PASS	REV LTR
		PL19D423719G2	A	PL19C327121G1		PL19C321525G1	
		PL19D423719G2	A	PL19C327121G1		PL19C327669G1	

(19R622316, Rev. 3)

SCHEMATIC DIAGRAM

138—174 MHz,
60 WATT POWER AMPLIFIER

PARTS LIST

LBI30354B

132-174 MHz, 60 WATT
POWER AMPLIFIER
19D424089G1 EXTERNAL RELAY
19D424089G2 INTEGRAL RELAY

SYMBOL	GE PART NO.	DESCRIPTION
A201		PA MODULE 19D423719G2
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1*	19A116656P12J0	Ceramic disc: 12 pf ±5%, 500 VDCW, temp coef 0 PPM.
		Earlier than REV A:
	7489162P6	Silver mica: 10 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
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	Silver 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	Metallized teflon: 68 pf ±5%, 250 VDCW.
C21	19A700015P16	Metallized teflon: 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.
		Earlier than REV A:
	19A116655P8	Ceramic disc: 150 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 C38	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.
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 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.
		Earlier than REV A:
	19A136531P1	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).
A202		PA BOARD 19C327121G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A700015P16	Metallized teflon: 30 pf ±5%, 250 VDCW.
C2	19A116795P120J	Silver mica: 120 pf ±5%, 250 VDCW; sim to Underwood Type J1HF.
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.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A700113P32	Composition: 51 ohms ±5%, 1/2 w.
		- - - - - - - - - - NETWORKS - - - - - - - - - -
Z1		FILTER ASSEMBLY 19B219649G1
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A129349G2	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 - - - - - - - - - -
FL201		COMPONENT BOARD 19C321525G1
		- - - - - - - - - - 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.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J202	19A130924G1	Connector, receptacle: jack type; sim to Cinch 14H11613.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A129568P1	Coil.
L2	19A129570P1	Coil.
L3	19A129569P1	Coil.
L4	19A129575P1	Coil.
L5	19A129569P1	Coil.
L6	19A129570P1	Coil.
W1 and W2		- - - - - - - - - - CABLES - - - - - - - - - -
		(Part of printed board 19C321524P1).
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.
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	19B209558P1	Hermetic sealed: 180 to 341 ohms coil res, 2 form C contacts, 8.0 to 16.3 VDC; sim to GE 3SAV1760A2.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A129569P1	Coil.
L2	19A129570P1	Coil.
L3	19A129569P1	Coil.
L4	19A129575P1	Coil.
L5	19A129569P1	Coil.
L6	19A129570P1	Coil.
W1 thru W4		- - - - - - - - - - CABLES - - - - - - - - - -
		(Part of printed board 19C327670P1).
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q201	19A134340P1	Silicon, NPN.
Q202	19A134340P2	Silicon, NPN.
Q203	19A134387P1	Silicon, NPN.
Q215	19A116742P1	Silicon, NPN.
		- - - - - - - - - - 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 - - - - - - - - - -
	19C321591G4	Heat sink.
	19D416275P3	Filter housing. (FL201).
	19C327282P1	Insulator. (Used with W214).
	N44P9006C6	Machine screw: No. 4-40 x 3/8. (Secures Q1, Q201, Q202).
	19A130568P1	Plate. (Used with Q215).
	19A116023P1	Insulator, plate. (Used with Q215).
	19A134016P1	Insulator, bushing. (Used with Q215).
	4029851P6	Clip loop. (Secures W215).
	7874455P2	Solderless terminal. (Used with #217).
	19B201074P305	Tap screw, Phillips POZIDRIV®: No. 6-32 x 5/16. (Secures A201).
	19A129434P1	Washer. (Used with C297, C298).
	19B201074P312	Tap screw, Phillips POZIDRIV®: No. 6-32 x 3/4. (Secures FL201 can).
	19B226952G1	P.A. Cover.
	19A129361P2	Shield. (Located on FL201 & FL202).
	7139898P3	Nut, hex, brass: 1/4-28. (Used with C297 & C298).

*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 - Power Amplifier Assembly 19D424089G1, G2
To incorporate new PA Module. Changed PA Module from 19D423719G2 to 19D424309G5.

REV. A - Power Amplifier Module 19D423719G2
To improve PA Input VSWR. Changed C1, C28 and L8.