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## DESCRIPTION

The RF Output Module contains the PA/Antenna Switch Assembly for the MASTR® Executive II Vehicular Repeater and uses a single RF power transistor to provide a power output of 300 milliwatts. A solid state antenna switch is used to switch the antenna from the receiver to the power amplifier output circuit.

Supply voltage for the PA is connected through cable W215 to the System Board. C2, C3, C4 and L1 prevent RF from getting on the power input lines.

The hinged PA heat sink pivots 90° to provide access to the power amplifier/antenna switch board and low pass filter.

## CIRCUIT ANALYSIS

The exciter output is coupled through an RF cable W216 to H2. The RF is then coupled by the microstrip to the base of RF power transistor Q1. A ground on the TX ENABLE line turns Q2 on and forward biases CR1 permitting the RF output of Q1 to be coupled through cable W214 to the low pass

filter. The RF is prevented from reaching the receiver circuit due to CR2 being reversed biased. CR2 is reversed biased since Q3 is turned on by the ground on the TX ENABLE line which turns off Q4. L3 and L5 prevent RF from affecting Q2 and Q4 operation.

The PA output is coupled through the low pass filter and appears at the antenna jack J202. A 20 dB pad provides isolation between the antenna circuit and the mobile detector jack J201. Isolation is also provided by the pad between the repeater receiver and transmitter circuit and the mobile detector.

A receive signal at J202 is coupled through the low pass filter and cable W214 to the antenna switch circuit. When the transmitter is not keyed, the TX ENABLE is high. Q3 is turned off, so Q4 is turned on. With Q4 on, CR2 is forward biased and permits the receive signal to appear at P102. CR1 is reversed biased to prevent any RF from the exciter from being coupled to the receiver since Q2 will be off.

The receive signal is applied to the mobile detector circuit J201 through the 20 dB pad on the low pass filter module.

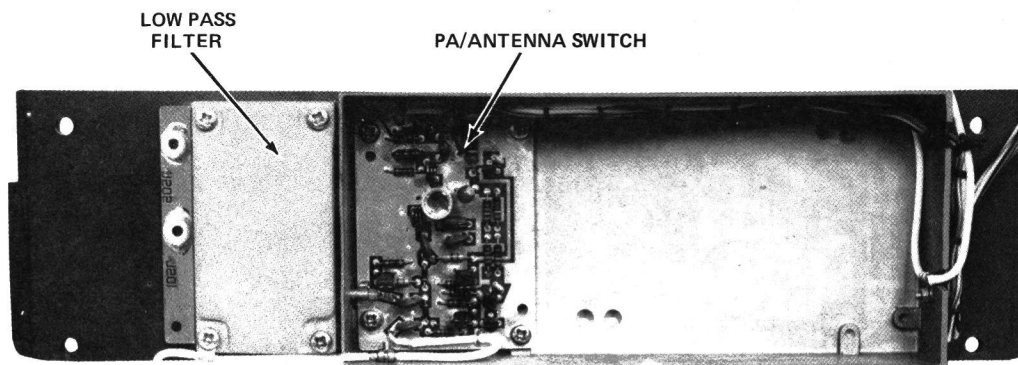
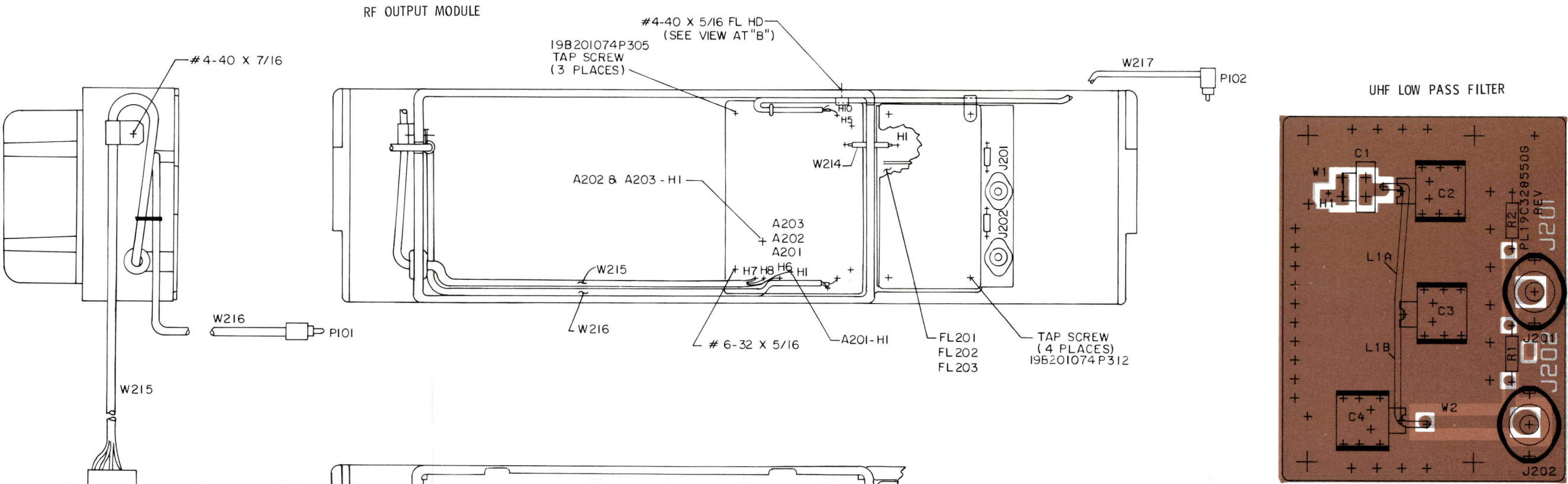


Figure 1 - PA/Antenna Switch

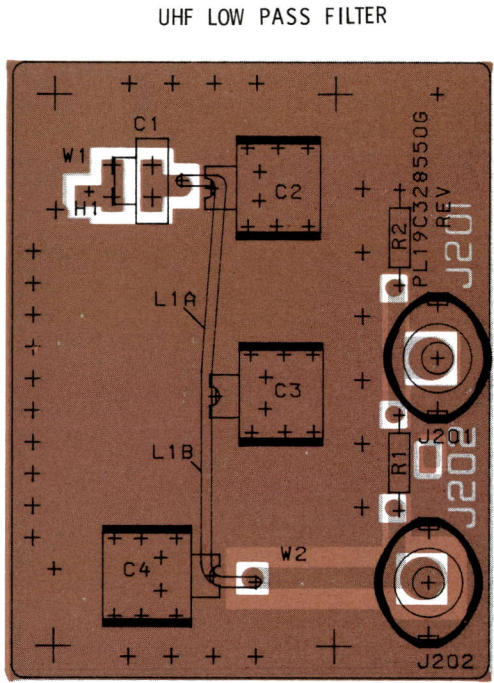
GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION  
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.



VIEW AT "B"  
TO SHOW CABLE CLAMP  
ON TOP OF SCREW

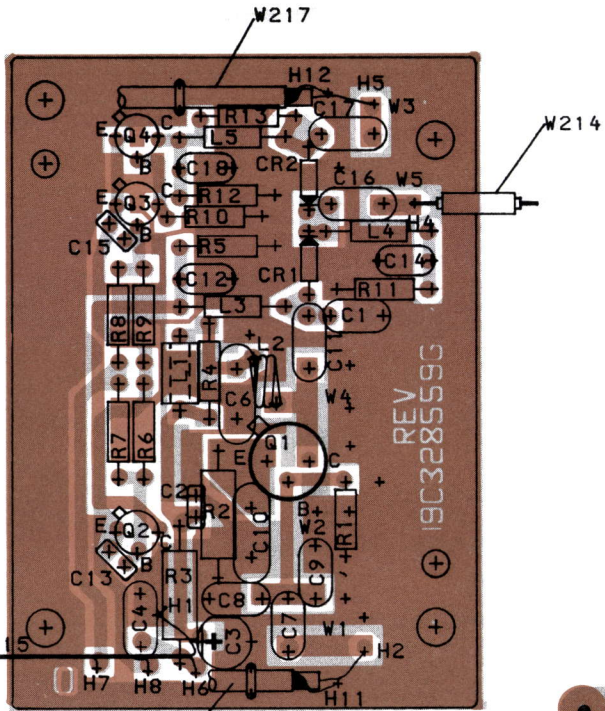
PA COVER  
19B226952G2

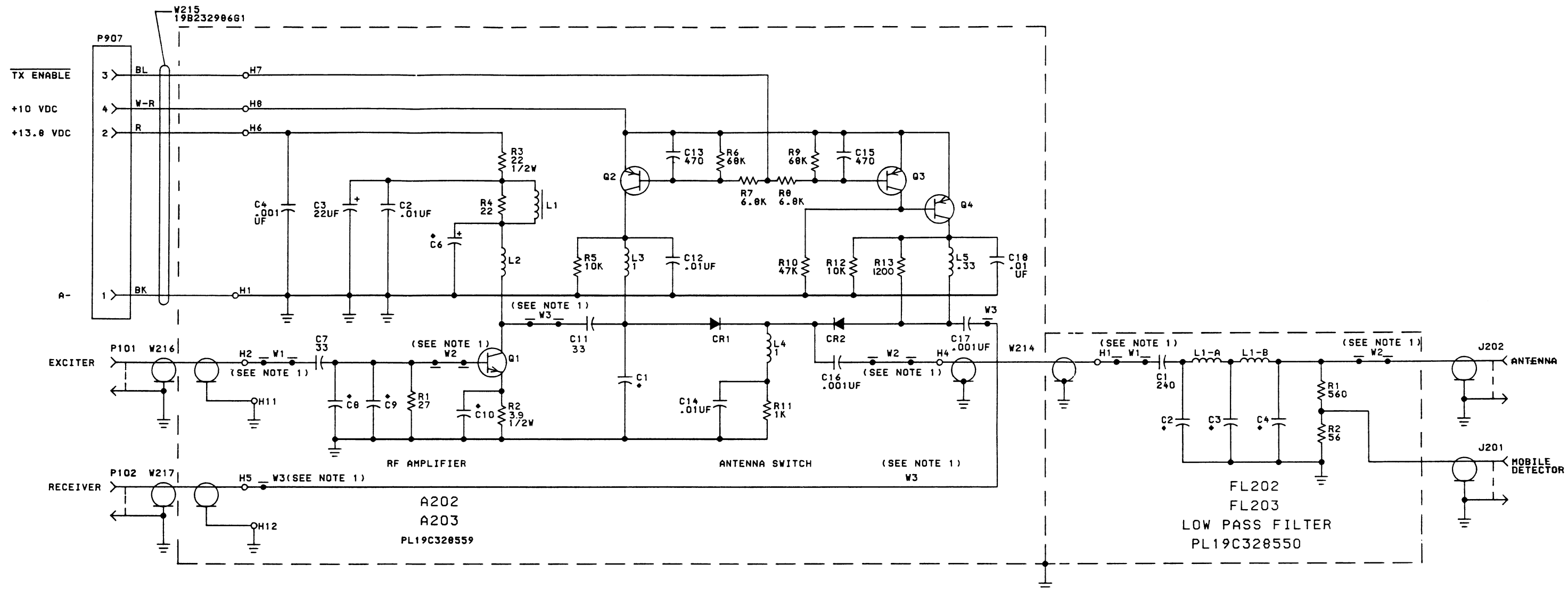
(19C330483, Rev. 0)



(19C328551, Rev. 1)  
(19A138404, Sh. 1, Rev. 0)  
(19A138404, Sh. 2, Rev. 0)

PA/ANTENNA SWITCH





NOTES:  
1. MICROSTRIP (PART OF P.W. BD.)

♦COMPONENT VALUE AS FOLLOWS:		
COMPONENT	LL 406-420 MHZ	H 450-512 MHZ
A202 & A203-C1	4	2.2
A202 & A203-C6	27	18
A202 & A203-C8	8	6
A202 & A203-C9	8	6
A202 & A203-C10	33	27
FL202 & FL203-C2	10	9
FL202 & FL203-C3	20	18
FL202 & FL203-C4	11	10

MODEL NO	REV LETTER
PL19D42988162	
PL19D42988163	
PL19C32855961	B
PL19C32855962	C
PL19C32855061	
PL19C32855062	

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 PICO FARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF-MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH-MILLIHENRYS OR H-HENRYS.

SCHEMATIC DIAGRAM  
RF OUTPUT MODULE

PARTS LIST

406-512 MHz RF OUTPUT MODULE  
19D429881G2 406-420 MHz  
19D429881G3 450-512 MHz  
ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
A202 and A203		AMPLIFIER/ANTENNA SWITCH A202 19C328559G1 406-420 MHz A203 19C328559G2 405-512 MHz
		- - - - - CAPACITORS - - - - -
C1LL	19A116656P4J0	Ceramic disc: 4 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C1H	19A134100P20	Ceramic disc: 2.2 pF ±0.1 pF, temp coef 0 ±120 PPM.
C2	19A116192P1	Ceramic: 0.01 uF ±20%, 50 VDCW; sim to Erie 8121 Special.
C3	19A134202P6	Tantalum: 22 uF ±20%, 15 VDCW.
C4	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C6LL	7489162P13	Silver mica: 27 pF ±5%, 500 VDCW; sim. to Sprague Type 118.
C6H	19A700105P14	Silver mica: 18 pF ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C7	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C8LL	19A116656P8J0	Ceramic disc: 8 pF ±0.5 pF, 500 VDCW; temp coef 0 PPM.
C8H	19A116656P6J0	Ceramic disc: 6 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C9LL	19A116656P8J0	Ceramic disc: 8 pF ±0.5 pF, 500 VDCW; temp coef 0 PPM.
C9H	19A116656P6J0	Ceramic disc: 6 pF ±0.5 pF, 500 VDCW, temp coef 0 PPM.
C10LL	7489162P15	Silver mica: 33 pF ±5%, 500 VDCW; sim. to Sprague Type 118.
C10H	7489162P13	Silver mica: 27 pF ±5%, 500 VDCW; sim. to Sprague Type 118.
C11	19A116656P33J1	Ceramic disc: 33 pF ±5%, 500 VDCW, temp coef -150 PPM.
C12	19A700005P7	Polyester: 0.01 uF ±10%, 50 VDCW.
C13	19A116192P2	Ceramic: 470 pF ±20%, 50 VDCW; sim to Erie 811-A050-W5R-471M.
C14	19A700005P7	Polyester: 0.01 uF ±10%, 50 VDCW.
C15	19A116192P2	Ceramic: 470 pF ±20%, 50 VDCW; sim to Erie 811-A050-W5R-471M.
C16 and C17	19A116655P20	Ceramic disc: 1000 pF ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C18	19A700005P7	Polyester: 0.01 uF ±10%, 50 VDCW.
		- - - - - DIODES AND RECTIFIERS - - - - -
CR1 and CR2	19A116925P1	Silicon, pin: 35 volt Reverse Breakdown, 400 mW.
		- - - - - INDUCTORS - - - - -
L1	19A701091G1	Coil.
L2	19A129774P1	Coil. (Used with G1).
L2	19A701237P1	Coil. (Used with G2).
L3 and L4	19A700024P13	Coil, RF: 1.0 uH ±10%, 0.74 ohms DC res max; sim to Jeffers 4426-6K.
L5	19B209420P107	Coil, RF: .33 uH ±10%, .22 ohms DC res max; sim to Jeffers 4416-7K.

SYMBOL	GE PART NO.	DESCRIPTION
P907		- - - - - PLUGS - - - - - (Part of W215).
		- - - - - TRANSISTORS - - - - -
Q1	19A134237P1	Silicon, NPN.
Q2 thru Q4	19A700022P1	Silicon, PNP; sim to Type 2N3906.
		- - - - - RESISTORS - - - - -
R1	19A700106P25	Composition: 27 ohms ±5%, 1/4 w.
R2	19A700113P5	Composition: 3.9 ohms ±5%, 1/2 w.
R3	19A700113P23	Composition: 22 ohms ±5%, 1/2 w.
R4	19A700106P23	Composition: 22 ohms ±5%, 1/4 w.
R5	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R6	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R7 and R8	19A700106P83	Composition: 6.8K ohms ±5%, 1/4 w.
R9	19A700106P107	Composition: 68K ohms ±5%, 1/4 w.
R10	19A700106P103	Composition: 47K ohms ±5%, 1/4 w.
R11	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R12	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R13	19A700106P65	Composition: 1.2K ohms ±5%, 1/4 w.
		- - - - - CABLES - - - - - (Part of 19C328558P1 printed board).
W1 thru W5		
W214	19A130607G1	Cable, RF: approx 1 foot long.
W215	19B232986G1	Cable. (Includes P907).
W216	19A130909G3	Cable, RF: approx 15-3/4 inches long.
W217	19A130909G4	Coil, RF: approx 22-3/4 inches long.
		- - - - - FILTERS - - - - - LOW BAND FILTER 19C328550G1 406-420 MHz 19C328550G2 450-512 MHz
FL202 and FL203		
		- - - - - CAPACITORS - - - - -
C1	19A700015P38	Teflon/Mica: 240 pF ±5%, 250 VDCW.
C2LL	19A700014P4	Metallized teflon: 10 pF ±5%, 250 VDCW.
C2H	19A700131P9	Metallized teflon: 9 pF ±0.5 pF, 250 VDCW.
C3LL	19A700131P20	Metallized teflon: 20 pF ±0.5 pF, 100 VDCW.
C3H	19A700131P18	Metallized teflon: 18 pF ±0.5 pF, 250 VDCW.
C4LL	19A700131P11	Teflon/Mica; 11 pF ±0.5 pF, 250 VDCW.
C4H	19700014P4	Metallized teflon: 10 pF ±5%, 250 VDCW.
		- - - - - JACKS AND RECEPTACLES - - - - -
J201 and J202	19A700049P2	Connector, receptacle; 500 VDCW maximum; sim to NTTF-1058.
		- - - - - INDUCTORS - - - - -
L1LL	19B227084P1	Jumper.
L1H	19B227130G1	Jumper.
		- - - - - RESISTORS - - - - -
R1	19A700106P57	Composition: 560 ohms ±5%, 1/4 w.
R2	19A700106P33	Composition: 56 ohms ±5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - MISCELLANEOUS - - - - -
	19C321591G9	Heat sink.
	19D416275P3	Filter casting. (FL202 & FL203).
	19B226952G2	P.A. Cover.
	19B201074P305	Tap screw, Phillips POZIDRIV: No. 6-32 x 5/16. (Secures A202 & A203).
	19B201074P320	Tap screw, Phillips POZIDRIV: No. 6-32 x 1-1/4. (Secures FL202 & FL203).
	19A701863P4	Cable clip: sim to Weckesser Co. 3/16-4-128. (Secures W215).
	19A701332P4	Insulator, washer: nylon. (Used with Q1 on A202 & A203).
	19A701887P1	Heat sink. (Used with Q1 on A202 & A203).
	19A700114P1	Terminal, stud. (Used with C2-C4).
	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1. (Secures W216).

## 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 - AMPLIFIER/ANTENNA SWITCH 19C328559G1

REV. B - AMPLIFIER/ANTENNA SWITCH 19C328559G2

To improve receiver operation at high end of the frequency band.  
Changed R13 to 1200 ohms.

R13 was: 19A700106P65 - Composition: 560 ohms  $\pm 5\%$ , 1/4 w.

REV. B - AMPLIFIER ANTENNA SWITCH 19C328559G1

REV. C - AMPLIFIER ANTENNA SWITCH 19C328559G2

To increase output power across the frequency band. Changed C11 and R2.

C11 was: 19A116655P20 - Ceramic disc: 1000 pF  $\pm 10\%$ , 100 VDCW;  
sim to RMC Type JF Discap.

R2 was: 19A700113P7 - Composition: 4.7 ohms  $\pm 5\%$ , 1/2 w.