MAINTENANCE MANUAL
ORION™
POWER AMPLIFIER BOARD

B19/CAH-505AL	**60 WATTS**	**29-42 MHz**
B19/CAH-505BL	**60 WATTS**	**35-50 MHz**
B19/CAH-505AH	**110 WATTS**	**29-42 MHz**
B19/CAH-505BH	**110 WATTS**	**35-50 MHz**

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ERICSSON

COMPONENT IDENTIFICATION CHART

SYMBOL	CAH-505AL	CAH-505BL	CAH-505AH	CAH-505BH
C8	330 pF	150 pF	150 pF	150 pF
C16	--	--	470pF	390pF
C17	--	--	--	470 pF
C18	820 pF	820 pF	390 pF	470 pF
C23	- -	- -	470 pF	330 pF
C31	39 pF	27 pF	36 pF	27 pF
C32	47 pF	33 pF	39 pF	33 pF
C33	100 pF	39 pF	43 pF	39 pF
C34	36 pF	24 pF	30 pF	24 pF
C35	100 pF	47 pF	47 pF	47 pF
C36	30 pF	24 pF	30 pF	24 pF
C37	91 pF	82 pF	91 pF	82 pF
C38	24 pF	24 pF	27 pF	24 pF
C58	.001 µF	.001 µF	820 pF	820 pF
C63	--	39 pF	47 pF	39 pF
C64	--	47 pF	47 pF	47 pF
C72	15 pF	33 pF	30 pF	33 pF
C73	100 pF	43 pF	68 pF	43 pF
C74	82 pF	82 pF	100 pF	82 pF
C75	--	22 pF	20 pF	22 pF
C76	39 pF	47 pF	62 pF	47 pF
C83	.001 µF	820 pF	- -	- -
C84	200 pF	120 pF	- -	120 pF
C163	56 pF	47 pF	56 pF	47 pF
C164	100 pF	82 pF	100 pF	82 pF
C165	27 pF	22 pF	27 pF	22 pF
C166	68 pF	47 pF	68 pF	47 pF
C167	39 pF	33 pF	39 pF	33 pF
L8	4.5T (R)	3.5T (R)	4.5T (R)	3.5T (R)
L9	5.5T (R)	4.5T (R)	5.5T (R)	4.5T (R)
L10	5.5T (R)	4.5T (R)	5.5T (R	4.5T (R)
L11	5.5T (L)	4.5T (L)	5.5T (L)	4.5T (L)
L18	2.5T (R)	3.5T (R)	2.5T (R)	3.5T (R)
L19	5.5T (R)	4.5T (R)	5.5T (R)	4.5T (R)
L153	120 nH	100 nH	120 nH	100 nH
L154	180 nH	150 nH	180 nH	150 nH
R6	4.7 ohms	4.7 ohms	2.2 ohms	2.2 ohms
R8	18 ohms	22 ohms	22 ohms	22 ohms
R10	2.2 ohms	4.7 ohms	4.7 ohms	4.7 ohms
R11	2.2 ohms	4.7 ohms	4.7 ohms	4.7 ohms
R42	4.7 ohms	4.7 ohms	- -	- -
R46	15ohms	22 ohms	22 ohms	22 ohms
T5	H-6LHLD00011	H-6LHLD00011	H-6LHLD00012	H-6LHLD00012
TR3, TR4	2SC2540	2SC2540	2SC2695	2SC2695

(DDOO-CAH-505 2/2)

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DESCRIPTION

The RF Power Amplifiers for the Ericsson ORION low band mobile radio is available in two power levels and two frequencies ranges designated as:

- 29-42 MHz , 60 Watts
- 35-50 MHz , 60 Watts
- 29-42 MHz , 110 Watts
- 35-50 MHz , 110 Watts

The circuitry on the Power Amplifier Board consists of an Exciter circuit, an RF Power Amplifier circuit, a Power Control circuit, an Antenna Switch and Limiter Circuit (see Figure 1 - Block Diagram). The Exciter circuit consists of two wide band amplifier stages operating over a frequency range of 29-50 MHz without any tuning. This circuit amplifies the one milliwatt input signal from the Voltage Controlled Oscillator, on the Synthesizer/IF board, to 300 milliwatts to drive the Power Amplifier.

The Power Amplifier circuit uses a driver and three RF power transistors to provide rated output power. The output power is adjustable over a range of 55 to 110 and 30 to 60 watts for the two power versions. Two transistors and three IC's are used in the power control circuit.

Supply voltage for the PA is provided by power leads from the power cable connector J1002 to J3 (A+) and (A-) on the Power Amplifier board.

CIRCUIT ANALYSIS

EXCITER

The 29-50 MHz Tx injection input from the Tx VCO is applied to **AMPLIFIER-1** transistor TR151 through an **ATTENUATOR** pad consisting of resistors R151, R152 and R153. Vcc voltage (+9 Vdc) is applied through a Vcc feed network consisting of resistor R158 and transformer T151. Capacitor C156 is used to bypass the supply line. The +9 Vdc is supplied by 3-terminal voltage regulator IC3.

The output of TR151 drives **AMPLIFIER-2** transistor TR152 through impedance matching components consisting of transformers T151 and T152, coupling capacitors C157 and C158. Resistors R152, R154 and diode CD151 set the bias voltage for TR152.

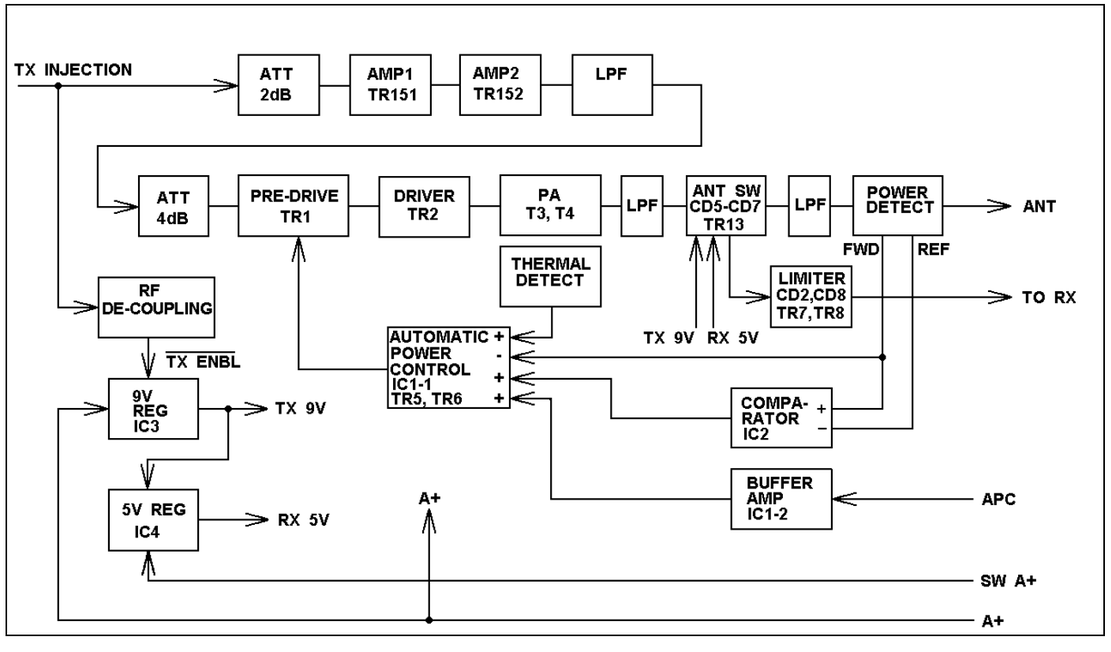


Figure 1 - Block Diagram Low Band Power Amplifier

Collector voltage (+9 Vdc) of TR152 is applied through collector feed network resistor R165 and inductor L152. Capacitors C160 and C161 are bypass capacitors.

The output of TR152 is coupled to **EX OUT** through the **LOW-PASS FILTER** consisting of capacitors C163 through C167, and inductors L153 and L154. Resistor R163 provides negative feedback for TR152 through capacitor C159. Transistor TR152 amplifies the 15 milliwatts input level to 300 milliwatts.

A+, supplied from the J1003 connector through transistor TR11 and the Tx Power Switch is regulated to 9 Vdc by voltage regulator IC3. Vcc (+9 Vdc) is applied to TR151 and TR152. When **TX ENBL** is high (receive mode), +9 Vdc is not applied.

The exciter is energized by pressing the PTT switch. Regulated +9 Vdc is present on all exciter stages when the radio is turned on.

POWER AMPLIFIER BOARD

The four power amplifiers which cover the frequency ranges of 29-42 MHz and 35-50 MHz and power levels of 60 watts and 110 watts, are very similar in construction and operation. The only differences are in the transistor types and some component values. The following description applies to all four versions.

RF Amplifiers

The Exciter RF output (EX OUT) is coupled to the PA input. The RF is then coupled through an **ATTENUATOR** pad consisting of resistors R1, R2 and R3, impedance matching transformer T1 and decoupling capacitor C1 to the base of **PRE-AMPLIFIER** transistor TR1. Inductor L1, diode CD1 and resistor R5 set the bias of TR1. Capacitor C4 and resistors R4 and R45 provide negative feedback to improve the stability of TR1. Collector voltage on TR1 is controlled by the power control circuit and is applied through a decoupling network consisting of capacitors C5, C6 and C7.

The output of TR1 is coupled to the base of **DRIVER AMPLIFIER** transistor TR2 through impedance matching transformer T2 and a frequency compensator consisting of capacitor C9 and resistor R6. Capacitor C8 provides matching between T2 and the base of TR2. Capacitor C10 and resistor R7 provide negative feedback and R8 and R46 maintains stability of TR2.

Collector voltage to driver amplifier TR2 is supplied through a decoupling network consisting of capacitors C12 to C14 and inductor L4.

The RF output from TR2 is coupled to **POWER AMPLIFIER** transistors TR3 and TR4 through impedance matching transformer T4 and capacitors C17 and C56.

Power Amplifier

The **POWER AMPLIFIER**, consisting of transistors TR3 and TR4, and transformers T4 and T5 is a class-c push-pull power amplifier. Transformer T4 provides impedance-matching and power splitting to the bases of TR3 and TR4. Capacitors C17 and C56 provide impedance-matching elements to T4. Resistors R10 and R11 provide the base loading to TR3 and TR4. Capacitors C19 and C21, and resistors R9 and R12 are negative feedback elements to maintain the stability of TR3 and TR4. Transformer T5 provides impedance-matching and power combining for the collectors of TR3 and TR4. Capacitors C16 and C23 provide matching elements to T5. Capacitors C20 and C22 provide impedance matching elements to the collector of TR3 and TR4.

Operating voltage for the power amplifier is supplied from the DC input through transformer T5 and a decoupling network consisting of capacitors C24 through C26 and inductor L5.

The output of the **POWER AMPLIFIER** passes through T5 to the **LOW-PASS FILTER** consisting of capacitors C72 though C76, and inductors L18 and L19.

NOTE

This is a 50 ohm point and may be used for checking power levels.

The RF power passes through a 50 ohm microstrip and transmit/receive **ANTENNA SWITCH** diode CD5 to the **LOW-PASS FILTER**

Power Control

When high VSWR load conditions are sensed the **POWER CONTROL** circuit provides closed-loop RF power leveling and power turndown.

When the transmitter is keyed, Tx 9V turns on and supplies current to a **DC AMPLIFIER** consisting of transistors TR5, TR6 and IC1-1. This amplifier supplies voltage to the collector of TR1. The setting of RV1 determines the current supplied to the negative input of IC1-1. As the detected RF power increases, the current to the negative input of IC1-1 increases causing IC1-1 to pull current away from the base of TR5. This cuts back the drive to TR5 and TR6, which

reduces the voltage at the collector of TR1, decreasing RF output power.

RF power is sensed by directional **POWER COUPLER** T6 and associated elements. Forward power is sensed by diode CD9 and reflected power by diode CD10. Forward power is determined by the setting of RV1. Resistors R21 and R22 set the level of reflected RF power at which the control circuit reduces the RF output.

Thermal protection is provided by **"posistor"** R41 and associated elements. Posistor R41 is thermally connected to the body of transistor TR3. As the temperature of TR3 rises above 100-degrees Centigrade, the resistance of R41 increases and TR9 turns on. This diverts output current of IC102 from R27 to TR9, which lowers the voltage at the collector of TR1, 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 transistors.

Antenna Switch

The **ANTENNA SWITCH** consists of PIN diodes CD5, CD6 and CD7 and associated components. When the transmitter is keyed, **Tx 9V** switch TR11 and the **Tx 9V** regulator IC3 turn on. **Rx 5V** (Rx bias) turns off and **Tx 9V** provides forward-bias to CD5. This results in low impedance on CD5 and high impedance on CD6 and CD7 isolating the transmitted power from the receiver.

Limiter

The limiter on the PA board consists of diode CD2, transistors TR6, TR7 and the associated components. During Rx if the receiving signal level exceeds +10 dBm, the rectified currents of the CD2 can provide the forward-bias to TR6, TR7 and CD8 proportionally to the receiving signal level. This causes a tap-down circuit (CD6, CD7 and CD8) to turn on when the receiving signal exceeds +10 dBm and protects the receiver from excessively high receiving signal levels.

In the Rx mode, signals from the antenna are coupled through this limiter to the receiver input.

POWER AMPLIFIER BOARD
CAH-505AL(Used in P1),CAH-505AL(Used in P2)
CAH-505AH(Used in P3),CAH-505BH(Used in P4)

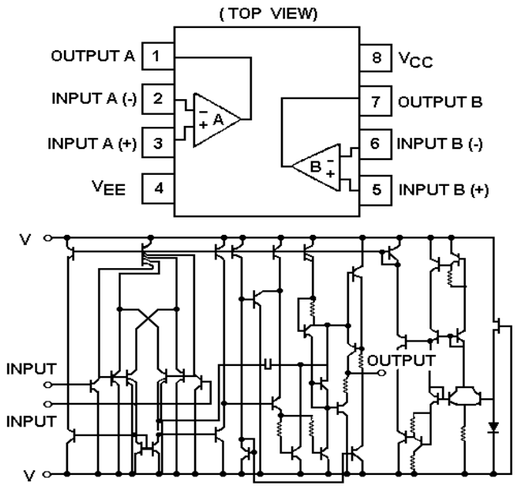
Issue 2

SYMBOL	PART NO.	DESCRIPTION
		---------- CAPACITORS ----------
C1 And C2	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C3 And C4	B19/5CAAD01078	Ceramic: 0.1 µF +80,-20% 25 VDCW, temp coef +30,-80%.
C5	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C6	B19/5CAAD01078	Ceramic: 0.1 µF +80,-20% 25 VDCW, temp coef +30,-80%.
C7	B19/5CRAA01230	Poli Film: 0.1 µF ±T% 50 VDCW, temp coef ±10%.
C8	B19/5CAAA00973	Ceramic: 330 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in AL).
C8	B19/5CAAA00958	Ceramic: 150 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in BL,AH AND BH).
C9	B19/5CAAD00781	Ceramic: 2200 pF 10% 50 VDCW, temp coef ±10 % (Used in AH AND BH).
C10	B19/5CAAD01702	Ceramic; 0.1 µF ±10% 50 VDCW temp coef ±10%.
C12	B19/5CEAA02912	Electrolytic: 10 µF ±20% 50 VDCW.
C13	B19/5CAAD01078	Ceramic: 0.1 µF +80,-20% 25 VDCW, temp coef +30,-80%.
C14	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C16	B19/5CMAB00141	Dipped Mica:470 pF ±5% 500 VDCW (Used in AH).
C16	B19/5CMAB00140	Dipped Mica:390 pF ±5% 500 VDCW (Used in BH).
C17	B19/5CMAB00141	Dipped Mica:470 pF ±5% 500 VDCW (Used in BH).
C18	B19/5CMAB02043	Mica:820 pF ±1% 100 VDCW (Used in AL AND BL).
C18	B19/5CMAB01187	Mica:390 pF ±1% 500 VDCW (Used in AH).
C18	B19/5CMAB01193	Mica:470 pF ±1% 500 VDCW (Used in BH).
C19	B19/5CAAA03083	Ceramic: 0.1 µF ±10% 50 VDCW, temp coef 15 %.
C20	B19/5CMAB01450	Mica:220 pF ±5% 500 VDCW.
C21	B19/5CAAA03083	Ceramic: 0.1 µF ±10% 50 VDCW, temp coef 15 %.
C22	B19/5CMAB01450	Mica:220 pF ±5% 500 VDCW.
C23	B19/5CMAB01193	Mica:470 pF ±1% 500 VDCW (Used in AH).
C23	B19/5CMAB01188	Mica:330 pF ±1% 500 VDCW (Used in BH).
C24	B19/5CEAA03688	Electrolytic: 47 µF ±20% 25 VDCW.
C25	B19/5CAAA00789	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C26	B19/5CAAD01267	Ceramic: 0.001 µF ±10% 50 VDCW, temp coef ±10%.
C27	B19/5CBAB02003	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef 0±60 PPM.
C28 And C29	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C30	B19/5CBAB02003	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef 0±60 PPM.
C31	B19/5CAAA03100	Ceramic:39 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in AL).
C31	B19/5CAAA03079	Ceramic:27 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in BL AND BH).
C31	B19/5CAAA03131	Ceramic:36 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in AH).
C32	B19/5CAAA03080	Ceramic:47 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in AL).
C32	B19/5CAAA03140	Ceramic:33 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in BL AND BH).
C32	B19/5CAAA03100	Ceramic:39 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in AH).
C33	B19/5CAAA03091	Ceramic:100 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in AL).
C33	B19/5CAAA03100	Ceramic:39 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in BL AND BH).
C33	B19/5CAAA03828	Ceramic:43 pF ±5% 500 VDCW temp coef 0±60 PPM (Used in AH).
C34	B19/5CAAA03131	Ceramic: 36 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL).
C34	B19/5CAAA03088	Ceramic: 24 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C34	B19/5CAAA03081	Ceramic: 30 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C35	B19/5CAAA03091	Ceramic: 100 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL).
C35	B19/5CAAA03080	Ceramic: 47 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL,AH AND BH).
C36	B19/5CAAA03081	Ceramic: 30 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL AND AH).
C36	B19/5CAAA03088	Ceramic: 24 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C37	B19/5CAAA03258	Ceramic: 91 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL AND AH).
C37	B19/5CAAA03096	Ceramic: 82 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C38	B19/5CAAA03088	Ceramic: 24 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL,BL AND BH).
C38	B19/5CAAA03079	Ceramic: 27 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C40 Thru C49	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C50	B19/5CAAA00789	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C52	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C53	B19/5CSAC01324	Tantalum: 0.22 µF ±20% 35 VDCW.
C54	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C55	B19/5CAAD01078	Ceramic: 0.1 µF +80,-20% 25 VDCW, temp coef +30,-80%.
C56	B19/5CSAC01645	Tantalum: 4.7 µF ±20% 16 VDCW.
C57	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C58	B19/5CAAA04822	Ceramic: 0.001 µF ±10% 50 VDCW, temp coef 0±30 PPM (Used in AL AND BL).
C58	B19/5CMAB02043	Mica: 820 pF ±1% 100 VDCW (Used in AH AND BH).
C59	B19/5CAAD01078	Ceramic: 0.1 µF +80,-20% 25 VDCW, temp coef +30,-80%.
C60	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C61	B19/5CSAC01558	Tantalum: 33 µF ±20% 16 VDCW.
C62	B19/5CSAC01416	Tantalum: 10 µF ±20% 16 VDCW.
C63	B19/5CAAA03100	Ceramic: 39 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C63	B19/5CAAA03080	Ceramic: 47 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C64	B19/5CAAA03080	Ceramic: 47 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL,AH AND BH).
C65	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C70 And C71	B19/5CBAB02420	Ceramic: 1000 pF +200% 50 VDCW, temp coef +20,-55%.
C72	B19/5CAAA03101	Ceramic: 15 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL).
C72	B19/5CAAA03140	Ceramic: 33 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C72	B19/5CAAA03081	Ceramic: 30 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C73	B19/5CAAA03091	Ceramic: 100 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL).
C73	B19/5CAAA03828	Ceramic: 43 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL).
C73	B19/5CMAB01506	Mica: 68 pF ±5% 500 VDCW (Used in AH).
C73	B19/5CMAB01775	Mica: 43 pF ±5% 500 VDCW (Used in BH).
C74	B19/5CAAA03096	Ceramic: 82 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL,BL AND BH).
C74	B19/5CAAA03091	Ceramic: 100 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C75	B19/5CAAA03086	Ceramic: 22 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C75	B19/5CAAA03093	Ceramic: 20 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C76	B19/5CAAA03100	Ceramic: 39 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL).
C76	B19/5CAAA03080	Ceramic: 47 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C76	B19/5CAAA03259	Ceramic: 62 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AH).
C80 Thru C82	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C83	B19/5CAAA04822	Ceramic: 0.001 µF ±10% 50 VDCW, temp coef 0±30 PPM (Used in AL).
C83	B19/5CMAB02043	Mica: 820 pF ±1% 100 VDCW (Used in BL).
C84	B19/5CAAA03961	Ceramic: 200 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in AL).
C84	B19/5CAAA03078	Ceramic: 120 pF ±5% 500 VDCW, temp coef 0±60 PPM (Used in BL AND BH).
C151 Thru C153	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C154	B19/5CAAD00838	Ceramic: 0.001 µF ±10% 50 VDCW, temp coef ±15%.
C155 Thru C158	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C159	B19/5CAAD01078	Ceramic: 0.1 µF +80,-20% 25 VDCW, temp coef +30,-80%.
C160 Thru C162	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
C163	B19/5CAAD00969	Ceramic: 56 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in AL AND AH).
C163	B19/5CAAD00854	Ceramic: 47 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in BL AND BH).
C164	B19/5CAAD00839	Ceramic: 100 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in AL AND AH).
C164	B19/5CAAD00960	Ceramic: 82 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in BL AND BH).
C165	B19/5CAAD00952	Ceramic: 27 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in AL AND AH).
C165	B19/5CAAD00840	Ceramic: 22 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in BL AND BH).
C166	B19/5CAAD00947	Ceramic: 68 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in AL AND AH).
C166	B19/5CAAD00854	Ceramic: 47 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in BL AND BH).
C167	B19/5CAAD00955	Ceramic: 39 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in AL AND AH).
C167	B19/5CAAD00948	Ceramic: 33 pF ±5% 50 VDCW, temp coef 0±30 PPM (Used in BL AND BH).
C168	B19/5CAAD01385	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±10%.
		---------- DIODES ----------
CD1	B19/5TXAD00356	Silicon: sim to TOSHIBA 1SS181 TE85L.
CD2	B19/5TXAD00320	Silicon: sim to TOSHIBA 1SS226 TE85L.
CD3	B19/5TXFA00009	SHOTKEY BARRIER: sim to NIHONINTER C25T04Q-TE24L.
CD4	B19/5TZAT00084	VARISTOR: sim to PANASONIC ERZ-CF2MK220.
CD5	B19/6AZLD00001	PIN DIODE.
CD6 Thru CD8	B19/6TXLD00001	PIN DIODE: sim to MITSUBISHI MI808.
CD9 And CD10	B19/5TZAT00135	Silicon: sim to PANASONIC MA741-TX.
CD151	B19/5TXAD00290	Silicon: sim to TOSHIBA 1SS184 TE85L.
		---------- INTEGRATED CIRCUIT ----------
IC1	B19/5DAAN00368	Linear OP amplifer: sim to New JRC NJM3404AM-T1.
IC2	B19/5DAAN00668	Comparator: sim to New JRC NJM2403M-T1.
IC3	B19/5DAAR00021	+9 V Voltage Regulator: sim to PANASONIC AN6541.
IC4	B19/5DAAR00163	+5 V Voltage Regulator: sim to PANASONIC AN6545SP-E1.
		---------- CONNECTORS ----------
J2	B19/5JWCL00045	Coaxial Connector.
J3	B19/5JTCW00060	Connector.
J4 And J5	B19/5JTCD00197	Connector.
J151	B19/5JWCL00045	Coaxial Connector.
J1001	B19/5JTGH00005	Coaxial Connector: TNC.
J1002	B19/5JWAV00159	Connector for power cable.
		---------- INDUCTORS ----------
L1	B19/5CLAA01017	Coil: 4.7 uH.

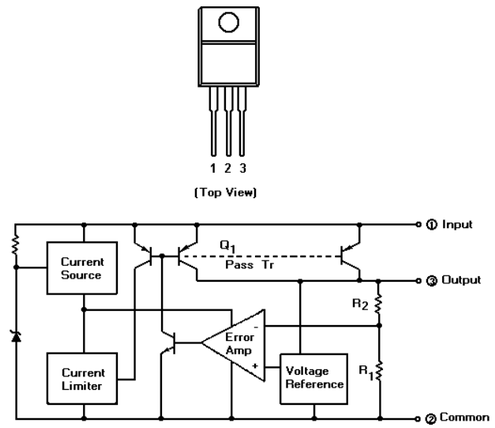
SYMBOL	PART NO.	DESCRIPTION
L4	B19/6LAFD01129	Coil: RF.
And		
L5		
L6	B19/5LCAA01018	Coil: 4.7 uH.
And		
L7		
L8	B19/6LALD23047	Coil:RF (Used in AL AND AH).
L8	B19/6LALD23037	Coil:RF (Used in BL AND BH).
L9	B19/6LALD23057	Coil:RF (Used in AL AND AH).
L9	B19/6LALD23047	Coil:RF (Used in BL AND BH).
L10	B19/6LALD23057	Coil:RF (Used in AL AND AH).
L10	B19/6LALD23047	Coil:RF (Used in BL AND BH).
L11	B19/6LALD00180	Coil:RF (Used in AL AND AH).
L11	B19/6LALD00179	Coil:RF (Used in BL AND BH).
L12	B19/5LCAA01017	Coil: 4.7 uH.
And		
L13		
L14	B19/5LCAP00366	Coil: 4.7 uH.
Thru		
L17		
L18	B19/6LALD23027	Coil: RF (Used in AL).
L18	B19/6LALD23037	Coil: RF (Used in BL,AH AND BH).
L19	B19/6LALD23057	Coil: RF (Used in AL AND AH).
L19	B19/6LALD23047	Coil: RF (Used in BL AND BH).
L151	B19/5LCAA01017	Coil: 4.7 uH.
And		
L152		
L153	B19/5LCAP00310	Coil: RF 120 nH (Used in AL AND AH).
L153	B19/5LCAP00299	Coil: RF 100 nH (Used in BL AND BH).
L154	B19/5LCAP00256	Coil: RF 180 nH (Used in AL AND AH).
L154	B19/5LCAP00233	Coil: RF 150 nH (Used in BL AND BH).
		---------- PCB ----------
PC1	B19/5PCLD00277C	PCB: H-6PCLD00277C.
		---------- RESISTORS ----------
R1	B19/5RDAC02163	Metal film: 270 ohms 5% 200 VDCW 1/8W.
R2	B19/5RDAC02210	Metal film: 22 ohms 5% 200 VDCW 1/8W.
R3	B19/5RDAC02163	Metal film: 270 ohms 5% 200 VDCW 1/8W.
R4	B19/5RDAC02443	Metal film: 390 ohms 5% 200 VDCW 1/8W.
R5	B19/5RDAC02132	Metal film: 1K ohms 5% 200 VDCW 1/8W.
R6	B19/5REAG02256	Metal film: 4.7 ohms 10% 200 VDCW 1/8W (Used in AL AND BL).
R6	B19/5REAG02247	Metal film: 2.2 ohms 5% 200 VDCW 1/8W (Used in AH AND BH).
R7	B19/5REBE00017	Metal film: 47 ohms 1% 500 VDCW 1.5W.
R8	B19/5RDAC02146	Metal film: 18 ohms 5% 200 VDCW 1/8W (Used in AL).
R8	B19/5RDAC02210	Metal film: 22 ohms 5% 200 VDCW 1/8W (Used in BL,AH AND BH).
R9	B19/5REBE00017	Metal film: 47 ohms 1% 500 VDCW 1.5W.
R10	B19/5REAG04807	Metal film: 2.2 ohms 10% 250 VDCW 1W (Used in AL).
R10	B19/5REAG04926	Metal film: 4.7 ohms 10% 250 VDCW 1W (Used in BL,AH AND BH).
R11	B19/5REAG04807	Metal film: 2.2 ohms 10% 250 VDCW 1W (Used in AL).
R11	B19/5REAG04926	Metal film: 4.7 ohms 10% 250 VDCW 1W (Used in BL,AH AND BH).
R12	B19/5REBE00017	Metal film: 47 ohms 1% 500 VDCW 1.5W.
R13	B19/5REAG04798	Metal film: 47 ohms 5% 250 VDCW 1W.
And		
R14		
R15	B19/5REAG03760	Metal film: 47K ohms 5% 200 VDCW 1/4W.
R16	B19/5REAG03462	Metal film: 47 ohms 5% 200 VDCW 1/2W.
And		
R17		
R18	B19/5RDAC02445	Metal film: 10K ohms 5% 100 VDCW 1/10W.
R19	B19/5REAG03813	Metal film: 100 ohms 5% 250 VDCW 1W.
R20	B19/5REAG04798	Metal film: 47 ohms 5% 250 VDCW 1W.
R21	B19/5RDAC02454	Metal film: 22K ohms 5% 100 VDCW 1/10W.
R22	B19/5RDAC02481	Metal film: 15K ohms 5% 100 VDCW 1/10W.
R23	B19/5RDAC02453	Metal film: 220K ohms 5% 100 VDCW 1/10W.
And		
R24		
R25	B19/5RDAC02451	Metal film: 2.2K ohms 5% 100 VDCW 1/10W.
R26	B19/5REAG04807	Metal film: 2.2 ohms 10% 250 VDCW 1W.

SYMBOL	PART NO.	DESCRIPTION
R27	B19/5RDAC02480	Metal film: 12K ohms 5% 100 VDCW 1/10W.
R28	B19/5RDAC02462	Metal film: 3.3K ohms 5% 100 VDCW 1/10W.
R29	B19/5RDAC02457	Metal film: 27K ohms 5% 100 VDCW 1/10W.
And		
R30		
R31	B19/5RDAC02446	Metal film: 1K ohms 5% 100 VDCW 1/10W.
And		
R32		
R33	B19/5RDAC02457	Metal film: 27K ohms 5% 100 VDCW 1/10W.
R34	B19/5RDAC02446	Metal film: 1K ohms 5% 100 VDCW 1/10W.
R35	B19/5REAG03488	Metal film: 390 ohms 5% 200 VDCW 1/4W.
R36	B19/5REAG03113	Metal film: 470 ohms 5% 200 VDCW 1/4W.
R37	B19/5RDAC02462	Metal film: 3.3K ohms 5% 100 VDCW 1/10W.
R38	B19/5RDAC02478	Metal film: 4.7K ohms 5% 100 VDCW 1/10W.
R39	B19/5RDAC02439	Metal film: 47K ohms 5% 100 VDCW 1/10W.
And		
R40		
R41	B19/5RXAE00098	Posistor: sim to MURATA PTH9C22BB471Q-T.
R42	B19/5REAG02256	Metal film: 4.7 ohms 10% 200 VDCW 1/8W (Used in AL AND BL).
R45	B19/5RDAC02443	Metal film: 390 ohms 5% 200 VDCW 1/8W.
R46	B19/5REAG01716	Metal film: 15 ohms 5% 200 VDCW 1/8W (Used in AL).
R46	B19/5RDAC02210	Metal film: 22 ohms 5% 200 VDCW 1/8W (Used in BL,AH AND BH).
R47	B19/5REAG04807	Metal film: 2.2 ohms 10% 250 VDCW 1W.
R48	B19/5RDAC02445	Metal film: 10K ohms 5% 100 VDCW 1/10W.
R151	B19/5RDAC02471	Metal film: 470 ohms 5% 100 VDCW 1/10W.
R152	B19/5RDAC02450	Metal film: 10 ohms 5% 100 VDCW 1/10W.
R153	B19/5RDAC02471	Metal film: 470 ohms 5% 100 VDCW 1/10W.
R154	B19/5RDAC02446	Metal film: 1K ohms 5% 100 VDCW 1/10W.
R155	B19/5RDAC02471	Metal film: 470 ohms 5% 100 VDCW 1/10W.
R156	B19/5RDAC02452	Metal film: 5.6K ohms 5% 100 VDCW 1/10W.
R157	B19/5RDAC02450	Metal film: 10 ohms 5% 100 VDCW 1/10W.
R158	B19/5RDAC02447	Metal film: 100 ohms 5% 100 VDCW 1/10W.
R159	B19/5RDAC02555	Metal film: 270 ohms 5% 100 VDCW 1/10W.
R160	B19/5RDAC02545	Metal film: 18 ohms 5% 100 VDCW 1/10W.
R161	B19/5RDAC02555	Metal film: 270 ohms 5% 100 VDCW 1/10W.
R162	B19/5RDAC02554	Metal film: 120 ohms 5% 100 VDCW 1/10W.
R163	B19/5RDAC02468	Metal film: 150 ohms 5% 100 VDCW 1/10W.
R164	B19/5RDAC02473	Metal film: 1.2K ohms 5% 100 VDCW 1/10W.
R165	B19/5REAG03789	Metal film: 10 ohms 5% 200 VDCW 1/4W.
RV1	B19/5RMAG00053	Variable: 10K ohms.
		---------- TRANSFORMERS ----------
T1	B19/6LHLD00010	RF TRANSFORMER.
T2	B19/6LHFD00005	RF TRANSFORMER.
T4	B19/6LVBN00003	RF TRANSFORMER.
T5	B19/6LHLD00011	RF TRANSFORMER:
T5-1	B19/5MBAA00927	FERRITE CORE: 10~15~20 (Used in AL AND BL).
T5	B19/6LHLD00012	RF TRANSFORMER:
T5-1	B19/5MBAA00928	FERRITE CORE: 16~16~32 (Used in AH AND BH).
T6	B19/6LHLD00009	RF TRANSFORMER FOR COUPLER.
T151	B19/6LHLD00010	RF TRANSFORMER:
And		
T152		
		---------- TERMINALS ----------
TB2	B19/5JTGH00004	Terminal Plate.
		---------- TRANSISTORS ----------
TR1	B19/5TCAD00040	Silicon,NPN: MITSUBISHI 2SC1971.
TR2	B19/5TCAD00097	Silicon,NPN: MITSUBISHI 2SC1729.
TR3	B19/5TCAD00073	RF POWER TRANSISTOR: 2SC2540 MITSUBISHI (Used in AL AND BL).
TR3	B19/5TCAD00165	RF POWER TRANSISTOR: 2SC2694 MITSUBISHI (Used in AH AND BH).
TR4	B19/5TCAD00073	RF POWER TRANSISTOR: 2SC2540 MITSUBISHI (Used in AL AND BL).
TR4	B19/5TCAD00165	RF POWER TRANSISTOR: 2SC2694 MITSUBISHI (Used in AH AND BH).
TR5	B19/5TBAR00001	Silicon,PNP: sim to PANASONIC 2SB953A.
TR6	B19/5TDAB00054	Silicon,NPN: sim to NEC 2SD596-T1B DV3.
TR7	B19/5TBAB00055	Silicon,PNP: sim to PANASONIC 2SB624-T1B BV3.
TR8	B19/5TDAB00054	Silicon,NPN: sim to NEC 2SD596-T1B DV3.
And		
TR9		

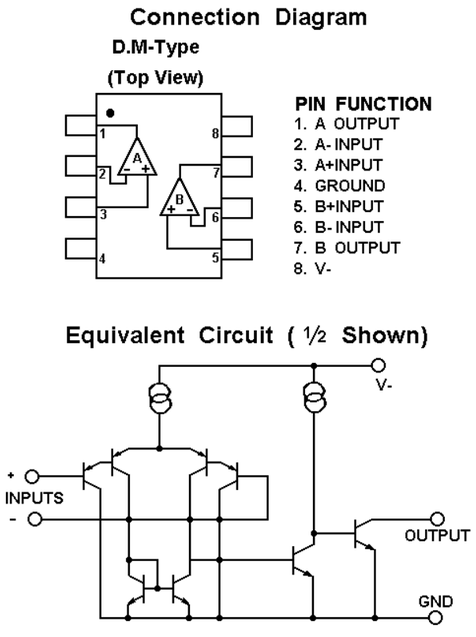
Linear OP amplifier IC1
(JRC NJM3404AM-T1)



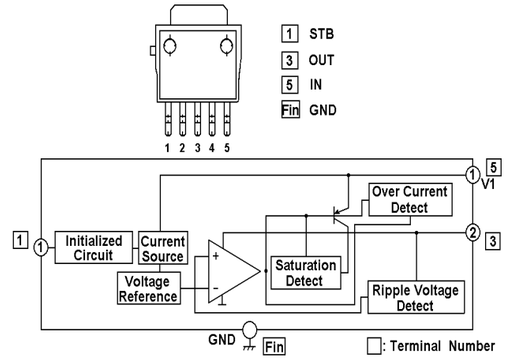
9 V Voltage Regulator IC3
(PANASONIC AN6541)

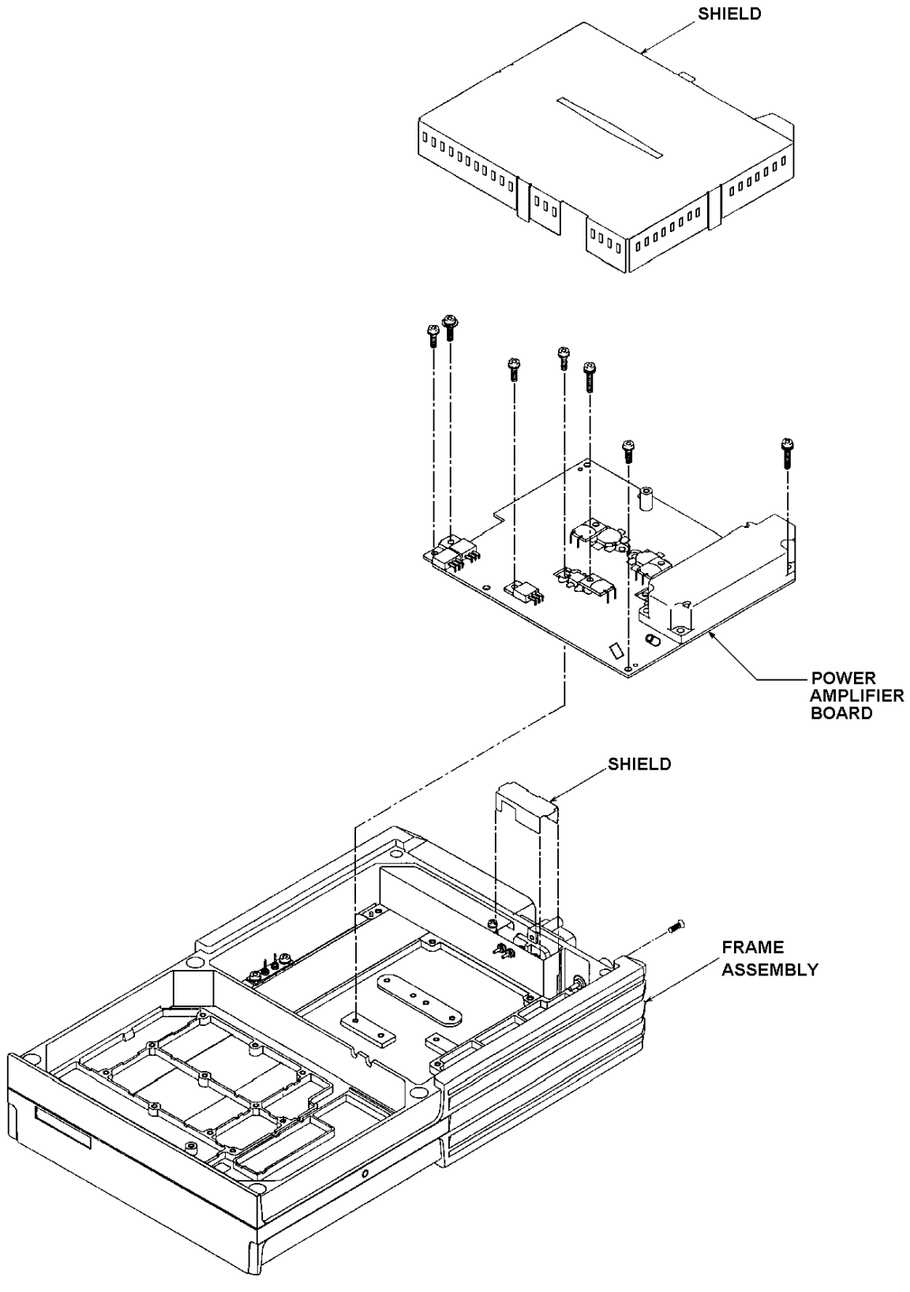


Comparator IC2
(JRC NJM2404M-T1)



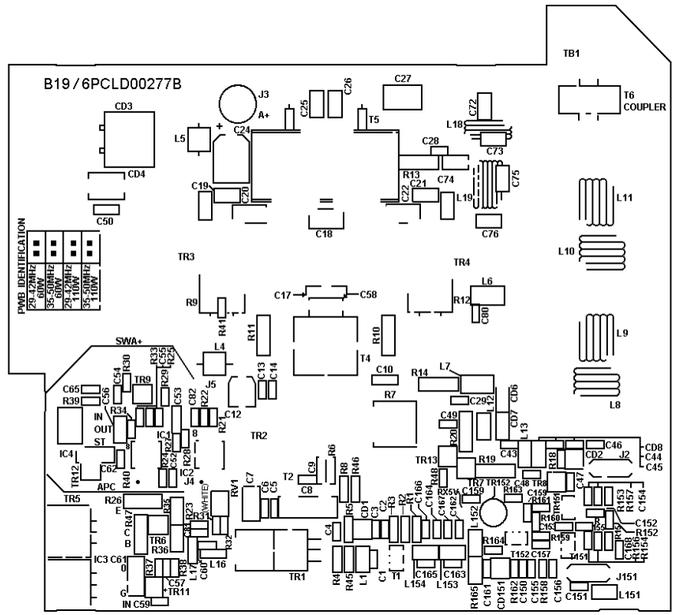
Voltage Regulator IC4
(PANASONIC AN6545SP)



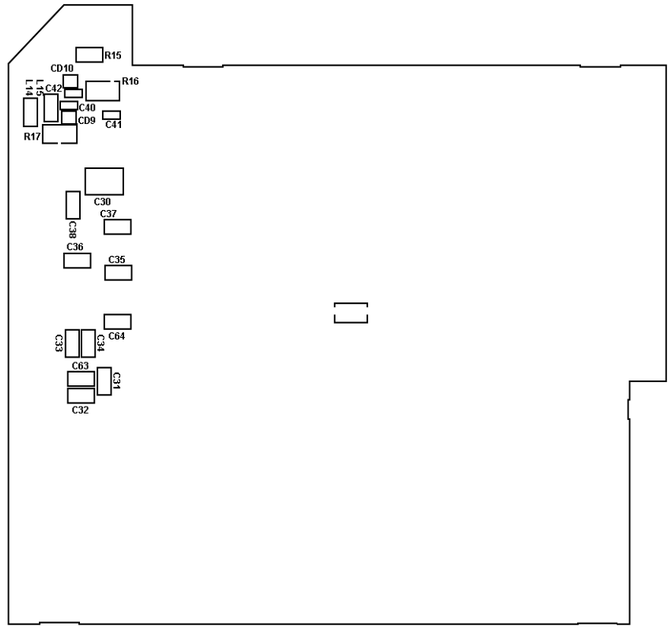


29.0-50 MHz 60/110 Watts
POWER AMPLIFIER

COMPONENT SIDE

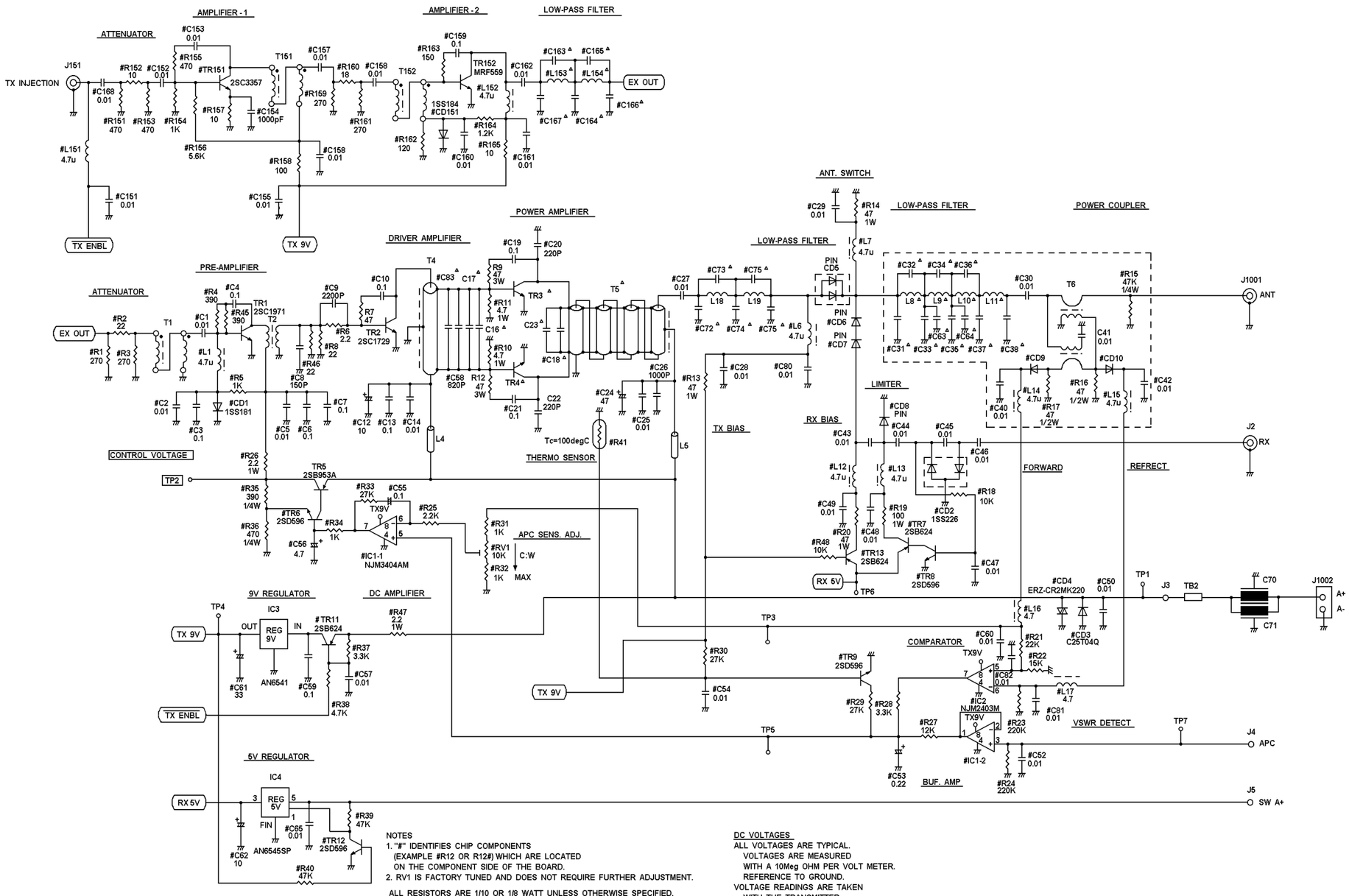


SOLDER SIDE



29.0-50 MHz 60/110 WATTS
POWER AMPLIFIER

(DD00-CAH-505 1/2)



NOTES
1. "#" IDENTIFIES CHIP COMPONENTS (EXAMPLE #R12 OR R12#) WHICH ARE LOCATED ON THE COMPONENT SIDE OF THE BOARD.
2. RV1 IS FACTORY TUNED AND DOES NOT REQUIRE FURTHER ADJUSTMENT.

ALL RESISTORS ARE 1/10 OR 1/8 WATT UNLESS OTHERWISE SPECIFIED.
RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER K OR M.
CAPACITOR VALUES IN u UNLESS FOLLOWED BY MULTIPLIER P.
INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER m OR u.

DC VOLTAGES
ALL VOLTAGES ARE TYPICAL.
VOLTAGES ARE MEASURED WITH A 10Meg OHM PER VOLT METER. REFERENCE TO GROUND.
VOLTAGE READINGS ARE TAKEN WITH THE TRANSMITTER UNKEYED / KEYED. EX. 45(UNKEYED) / 0.5 (KEYED).

29.0-50 MHz 60/110 WATTS POWER AMPLIFIER

(DD00-CAH-505 1/2)