MAINTENANCE MANUAL

CONTROL LOGIC/IF BOARD
CMC-855

NOISE BLANKER
CFG-138

TABLE OF CONTENTS

Page

DESCRIPTION 1
CIRCUIT ANALYSIS 1
Control Logic Section (CMC-855) 1
Microcomputer 1
Flash EEPROM (IC707) 1
CMOS SRAM (IC709) 1
EEPROM (IC708) 3
Application of Specific Integrated Circuits 3
ASIC (IC703) 3
Voltage Regulators (IC606, IC607) (IC605, IC608) 3
Audio Amplifier (IC604 3
Audio Signal Processor (ASP) (IC601) 3
RS-485 (IC705) 3
RS-232 (IC706) 3
Reset Circuit (IC610) 3
Option and Remote Control Connector (ORCC) 3
20.8 MHz IF Section (CMF-132) 3
1st IF 3
2nd Mixer 3
2nd IF And Detector 3
9 Volt Regulator 3
Noise Blanker (CFR-138) 3
Blanker Disable 4
IC DATA 5
20.8 MHz IF Section (CMF-132) 5
Control Logic Section (CMC-855) 5
Noise Blanker (CFR-138) 8

Continued

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TABLE OF CONTENTS

Page

PARTS LISTS:

Control Logic Section (CMC-855) 9
20.8 MHz IF Section (CMF-132) 10
Noise Blanker (CFR-138) 10
ASSEMBLY DIAGRAM 11
OUTLINE DIAGRAMS:
Noise Blanker (CFR-138) 11
Control Logic/IF Sections (CMC-855/CMF-132) 12
SCHEMATIC DIAGRAMS:
Control Logic Section (CMC-855) 13
20.8 MHz IF Section (CMF-132) 15
Noise Blanker (CFR-138) 16

ILLUSTRATIONS

Figure 1 - Logic Section Block Diagram 2
Figure 2 - 20.8 MHz IF Section Block Diagram 2
Figure 3 - Noise Blanker Block Diagram 4

NOTE

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

DESCRIPTION

The System Control Logic/IF circuit board combines functions of the receive circuit 1st IF, 2nd IF, audio detection, audio signal processing and control logic on one circuit board. As an option, an additional circuit board can be plugged into this board to provide **AEGIS** (digital encryption system). Programming and personality information is stored in **FLASH** and **EEPROM** memory on the logic/IF board. The audio speaker amplifier is also part of the same board. Also as an option, an additional circuit board is available to provide noise blanking.

Electrical interfaces are achieved between this board and the Control Unit (LCC), synthesizer, RF PA (APC) and the **O**ption and **R**emote **C**ontrol **C**onnector **(ORCC)** on the rear of the assembled radio.

All radio control signals originate or terminate on the control logic/IF board. Two microcomputers share the processing load. Control signals are connected through a high speed digital link with the control unit, either through the LCC or ORCC connectors, making possible either front or remote control for the radio. The same link also makes possible dual radio or dual control head configuration. An RS-232 compatible digital link is available at the ORCC interface, to facilitate programming or Radio Data Interface to Mobile Digital terminals.

This circuit board also generates Type 99, Channel Guard, GE-Star and DTMF signals if so programmed

The System Control Logic/IF board consists of the following control logic, IF and audio circuits (see figures 1 & 2).

CONTROL LOGIC SECTION (CMC-682)

- CMOS Microprocessor (IC701, IC702)
- Custom CMOS ASIC Chip (IC703)
- Address Decoder (IC704)
- RS-485 (IC705)
- RS-232 (IC706)
- Flash EEPROM (IC707)
- EEPROM (IC708)
- CMOS SRAM (IC709)
- CMOS Inverters (IC711)
- Silicon Serial Number (IC712)
- TTL Inverters (IC713)

IF SECTION (CMF-132)

- Custom CMOS ASP Chip (IC601
- Operational Amplifier (IC602, IC603)
- Audio Amplifier (IC604)
- 5 Volt Regulator (IC606, IC607)
- 9 Volt Regulator (IC605, IC608, IC609)
- Reset Circuit (IC610)
- Bilateral Switch (IC611, IC612)

CIRCUIT ANALYSIS

CONTROL LOGIC SECTION (CMC-855)

Microcomputer

The main microcomputer circuit in the **ORION** radio consist of microprocessor IC701, EEPROM IC708, Flash EEPROM IC707, RAM IC709 and custom ASIC IC703. This circuitry runs at a 9.8304 MHz rate determined by crystal X701 and controls the radio through a second microprocessor IC702. This second microprocessor runs at a 4.9152 MHz rate. The 4.9152 MHz rate is determined by ASIC IC703.

- Controlling the **ASIC**, **FLASH EEPROM** and **RAM**
- Loading data to the frequency synthesizer
- Fetching and processing the PTT, monitor, channel, selection and volume control
- Controlling the audio circuit (processor)
- Decoding the squelch
- Encoding/Decoding the Channel Guard and Digital Channel Guard
- Controlling the loading interface for the radio data (channel number and signaling)

Flash EEPROM (IC707)

This memory contains the software to control the microprocessor. This Flash EEPROM has a storage capacity of 512k x 8 bits.

CMOS SRAM (IC709)

This SCRATCH RAM has a storage capacity of 32k x 8 bits. The memory is available for variables, buffers, etc.

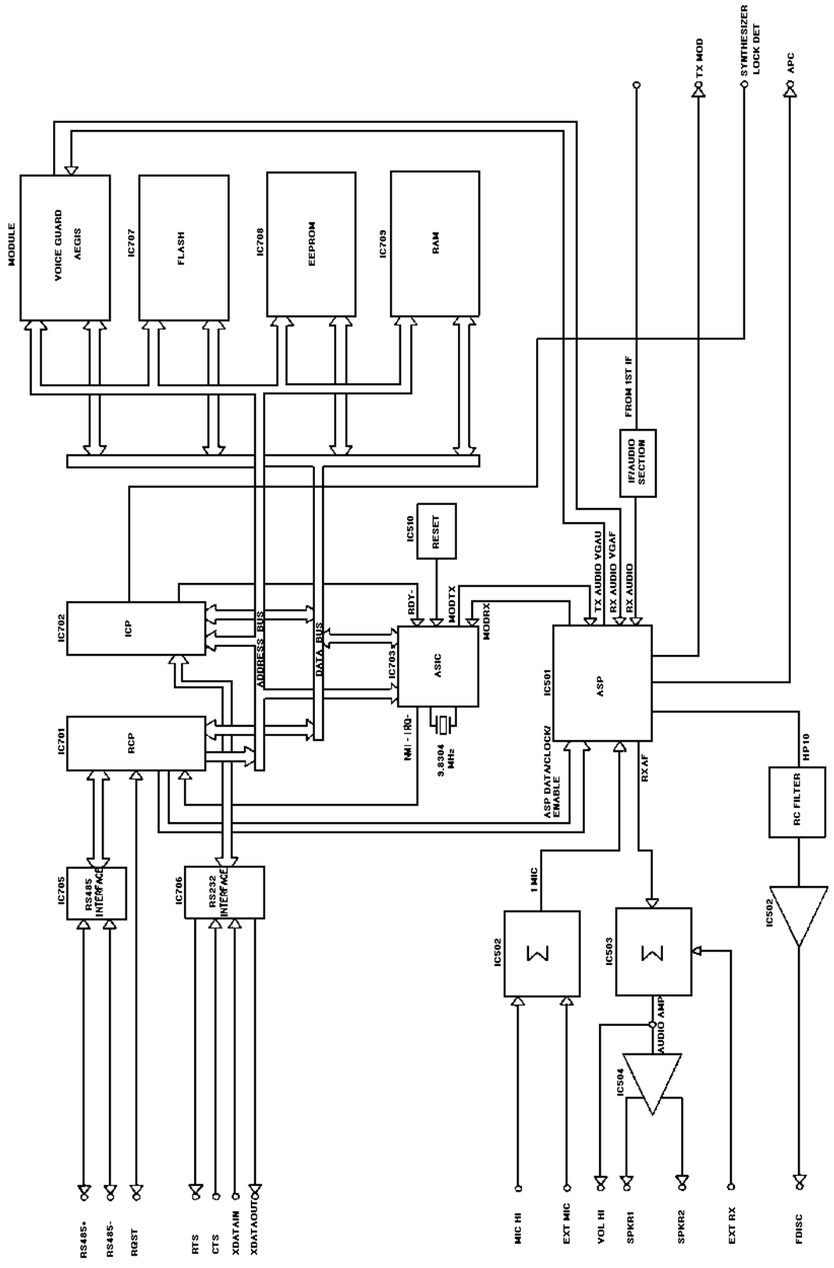


Figure 1 - Control Logic Section Block Diagram

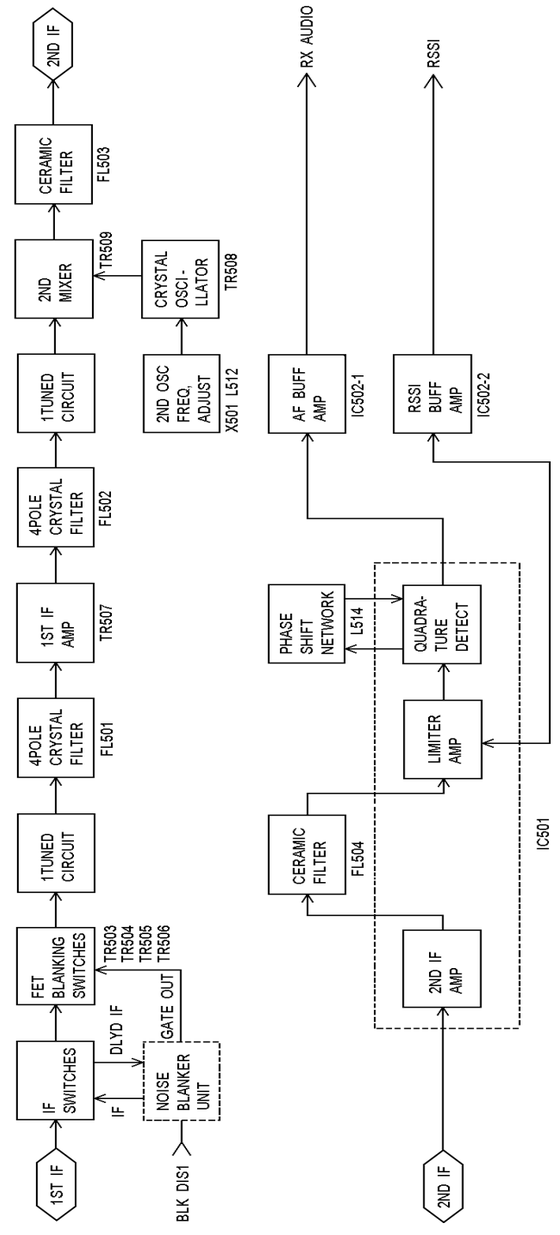


Figure 2 - 20.8 MHz IF Section Block Diagram

EEPROM (IC708)

This EEPROM has a storage capacity of 8k x 8 bits. The memory contains the user configurable parameters that must be maintained through a power cycle. This personality controls various functions of the radio. The personality data is entered from outside the radio through the ORCC connector to the microprocessor and then to the EEPROM.

The data mainly consists of the following:

- Channel Frequency Data
- CG/DCG Data
- Tx Power, Tx Modulation Data
- Squelch Data
- Display Data, etc.

Application Of Specific Integrated Circuits

ASIC (IC703)

The ASIC is basically a chip that integrates may miscellaneous functions. The chip provides functions as follows:

- MODEM
- Watch Dog Timer
- Clock Control
- Interrupt Control
- Address Decode etc.

Voltage Regulators (IC606, IC607) (IC605, IC608, IC609)

Voltage regulators IC606 and IC607 each generate a 5 Vdc for the Control Board. Voltage regulators IC605, IC608 and IC609 each generate a 9 Vdc for the Control Board and Voice Guard Adapter Module.

Audio Amplifier (IC604)

The audio amplifier is located between the audio processor and the speaker. Amplifier IC604 amplifies the output signal of the ASP (IC601) to the level adequate for driving the speaker.

Audio Signal Processor (ASP) (IC601)

The audio process consists of a one-chip IC accommodating almost all of the audio functions. The audio functions are under control of the microcomputer in compliance with the function of the radio unit.

The functions of the audio processor are as follows:

- Rx Audio process with Tone Reject Filter, De-emphasis and Programmable Attenuator.
- CG/DCG filtering and limiting
- Noise Squelch filtering and detecting
- 8 bits D/A Converter with sample and hold
- Tx audio process with microphone amplifier, pre-emphasis, deviation limiter, summing amplifier, post limiter filter and programmable attenuator
- Two 6 bits programmable divider for clock and alert tone

All of these functions are made up of switched capacitor filters, amplifiers and timing logic. The timing for this logic is derived from the 4.9152 MHz clock generator (ASIC).

RS-485 (IC705)

This is a high speed differential TRI-STATE bus/line transceiver designed to meet the requirements of EIA standard RS-485 specification. The IC705 is located between the Radio Unit and the Control Unit,and controls signalling between these points.

RS-232 (IC706)

In Low Band **ORION**, the RS-232 port is used for programming the radio. This port is controlled by IC706. This IC consists of line drivers/receivers designed to meet the requirements of EIA standard RS -232 specifications. The IC706 is located between the radio unit and the ORCC.

Reset Circuit (IC610)

This is an active low reset IC which includes a delay time generating circuit. Delay time can be set up by externally using a capacitor and a resistor. The function of this IC is to accurately reset the system after detecting voltage at the time of switching power on and instantaneous power off.

Option and Remote Control Connector (ORCC)

The ORCC is located on the rear of the radio and is used for options and accessories when Control Unit and Radio Unit are directly attached and for remote control in all other configurations. The ORCC allows various kinds of external equipment connections to be made. External equipment connecting signals are as follows:

PIN	SIGNAL	PIN	SIGNAL
1	SUP GND	20	RTS
2	XDATA IN	21	INP1
3	XDATA OUT	22	OUT1
4	RS485+	23	INP2
5	RS485-	24	IGN A+
6	CTS	25	SW +
7	GND	26	HKSW
8	FPROG	27	EXTMIC
9	OUT2	28	EXTRX
10	IGN SEN	29	FDISC
11	MIC HI	30	EXTALO
12	ALO	31	CUTST
13	VOL HI	32	SPARE
14	CTL ON	33	SPARE
15	XTONENC	34	SPARE
16	XTONEDEC	35	SDATA
17	RQST	36	SONOFF
18	SPKR1	37	HORNRING
19	SPKR2		

20.8 MHz IF SECTION (CMF-132)

1st IF

The 20.8 MHz 1st IF output signal is coupled from the output of the first mixer circuit, located on the Synthesizer/Receiver board, through 30-pin connector P501-1 and capacitor C501 to the source input of buffer amplifier **J**unction **F**ield **E**ffect **T**ransistors **(JFET)** TR501 and TR502. This input can be monitored at test point T**P1**. The output of TR501 and TR502 is coupled through capacitor C502 to the input of the optional noise blanker. If the noise blanker is not in the circuit, the input is connected through capacitor C538 to switchable networks through diodes CD501, CD502 and CD503. The output of the switchable networks connects through impedance matching network L504, L506 and associated circuit (by-passing IF blanking FET's TR503 and TR506) to 4-pole crystal band-pass filter FL501. The highly-selective crystal filters FL501-1 and FL502-2 provide the first part of receiver IF selectivity. The output of the filters is coupled through the impedance matching network consisting of inductor L508, capacitors C515 and C516, and resistor R513 to the base of 1st IF amplifier transistor TR507. The amplified signal is taken from the collector of TR507 and connected through an impedance matching network consisting of inductor L509, capacitor C520 and resistor R518 to the input of 4-pole crystal filter FL502. Crystal filters FL502-1 and FL502-2 provide the second part of receiver IF selectivity. The output of the crystal filters is coupled through an impedance-matching network consisting of inductor L511, capacitor C523, resistor R519 and coupling capacitor C523 to the base of 2nd IF amplifier transistor TR509.

2nd Mixer

The 20.8 MHz IF input is applied to the base of transistor TR509 and mixed with a 20.345 MHz frequency supplied by a crystal oscillator circuit consisting of X501 and oscillator transistor TR508. Variable inductor L512 sets the frequency of the oscillator circuit. This signal can be monitored at test point TP5.

2nd IF And Detector

The output of the 2nd mixer is coupled to the input of 4-pole ceramic filter FL503 which provides 455 kHz 2nd IF selectivity. The 455 kHz IF output of ceramic filter FL503 is coupled to Pin 3 of Limiter/FM Detector IC501. The IF signal is amplified internal to IC501 then applied to 4-pole ceramic filter FL504 which provides additional 455 kHz IF selectivity (Refer to **IC DATA** for IC501).The output of the 455 kHz filter is applied to IC501, Pin 7. The 2nd IF signal is amplified and limited internal to IC501. Inductor L514 shifts the IF signal by 90° and applies it to the internal FM detector. The FM detector compares the shifted IF signal to the internal IF signal to recover the audio modulation. The audio output of the operational amplifier internal to IC501 is applied the input of buffer amplifier IC502-2. The **AUDIO** output of IC502-2 is applied to the System Control Logic circuit. This signal can be monitored at test point TP4. The output on Pin 12 of IC501 is applied to the input of amplifier buffer IC502-1. The output of IC502-1 provides a **R**eceiver **S**ignal **S**trength **I**ndicator **(RSSI)** signal also sent to the System Control Logic circuit. This signal can be monitored at test point TP3.

9 Volt Regulator

The 9-volt regulator circuit powers the IF circuits of CMF-132 and consists of regulator IC503 and filter capacitors C570 ,C571, C572 and C573. An input voltage of +13.8 Vdc is applied to the input of IC503. This input is monitored at test point TP2.

NOISE BLANKER (CFR-138)

The Noise Blanker is a printed wire board subassembly that plugs into the receive circuit through connectors P1/P2/P3 and J501/J502/J503. The noise blanker is designed to improve receiver performance by blanking out impluse noise emanating from the alternator, ignition system, etc. This is accomplished by delaying the IF signal for 200 **n**ano**s**econds (**ns**) while generating a blanking gate (pulse) having the

same characteristics as the noise pulses. These blanking pulses are then used to turn off the delayed IF signal precisely where the noise occurs, resulting in noise-free audio reception.

The noise blanker may be disabled, if desired, by software control (by **EUS**).

The noise blanker consists of a 200 ns fixed delay line, 20.8 MHz rejection filter, three pulse amplifiers, a pulse amplifier/limiter, AGC amplifier, gate driver and blanker disable switch as shown in Figure 3 - Noise Blanker Block Diagram.

The IF signal from JFET buffer transistors TR501 and TR502, on the control logic/IF board, is applied to gate 1 of pulse amplifier transistor TR1 through the 10.8 MHz rejection filter and to delay line Z1. Delay line Z1 delays the IF signal by 200 ns and returns it to the two JFET gating switches on the control logic/IF board. The undelayed IF signal is amplified by pulse amplifier TR1. Transistor TR1 provides approximately 20 dB of amplification. Bias for TR1 is determined by resistors R1 and R2. Transistor TR1 is controlled by **A**utomatic **G**ain **C**ontrol (**AGC**) amplifier IC2, and transistors TR7, TR8 and TR9. The IF output of TR1 is further amplified and limited by pulse amplifier/limiter IC1. IC1 provides approximately 50 dB of amplification.

The output of the limiter is applied to pulse detector transistor TR2. DC bias for TR2 is set at the threshold of conduction so that all noise pulses regardless of magnitude or duration will be detected.

Threshold bias is established by resistors R12 thru R15 and diode CD1. Resistor R13 is a negative temperature compensating resistor where temperature characteristics complement IC1 to adjust the threshold level of TR2 with changes in temperature.

The detected pulse is taken from the collector of TR2 and further amplified by pulse amplifier transistors TR3 and TR5. Capacitor C18 in the emitter circuit of TR3 provides a low frequency bypass to ground and also maintains a full charge to allow TR3 to be switched on and off more rapidly. The output of pulse amplifier TR5 is applied to gate driver transistor TR6. Transistor TR6 provides drive to operate the four JFET switches (TR503 thru TR506) located just ahead of the crystal filters on the synthesizer/Receiver Board. The delayed IF signal from delay line Z1 arrives at TR503 and TR506 at the same time as the gating pulses from the blanker switch. The gating pulse switches TR503 and TR506 on coincident with the noise pulses on the IF signal, shunting all noise pulses to ground.

Blanker Disable

The blanker disable inputs are provided to assure complete turn off of the noise blanker function while allowing the delayed IF signal to be process through the receiver. **BLNKR DIS 1** is applied to pulse amplifier TR1, gate 2 and the base of TR4, turning it on. Transistor TR4 shorts the emitter and collector of pulse amplifier TR3, preventing any remaining noise pulses from passing.

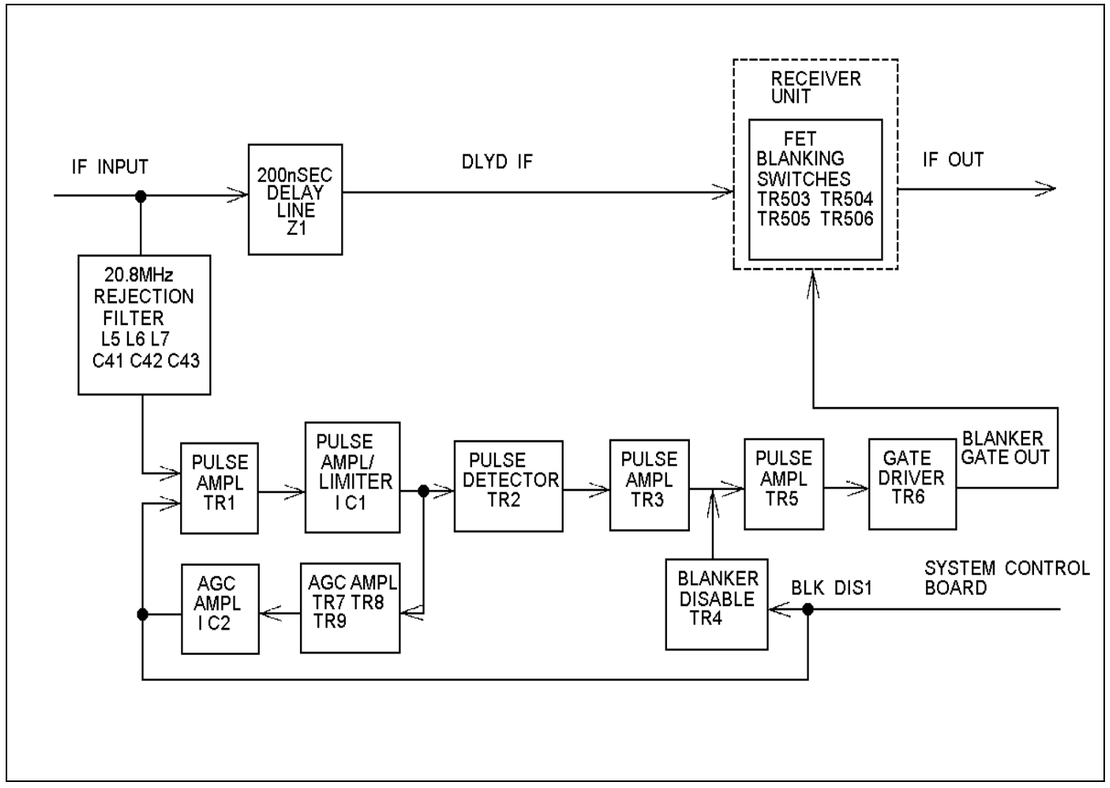
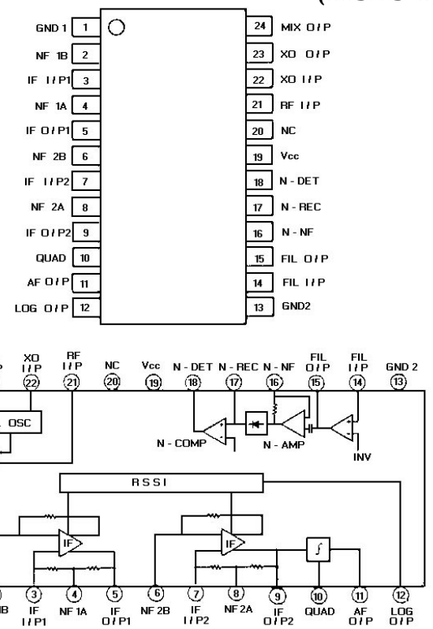


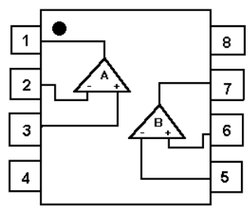
Figure 3 - Noise Blanker Block Diagram

20.8 MHz IF SECTION

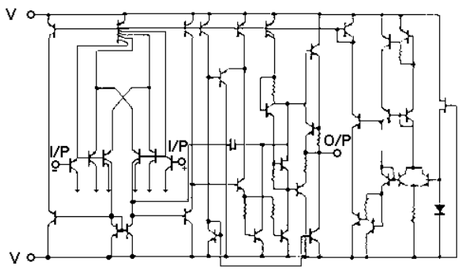
Linear, IF Amplifier/Detector IC501
(TA31132F)



Linear, Dual Operational Amplifier IC502
(NJM3404)

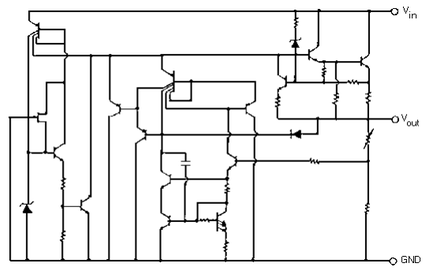


1. A OUTPUT
2. A - INPUT
3. A + INPUT
4. GROUND
5. B + INPUT
6. B - INPUT
7. B OUTPUT
8. V+



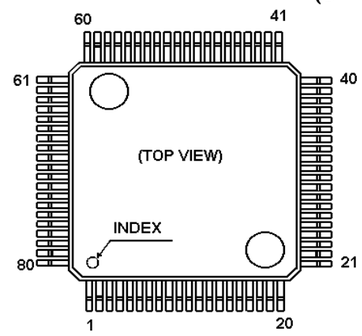
Linear, Positive Voltage Regulator IC503
(NJM78L09UA)

1. OUT
2. GND
3. IN

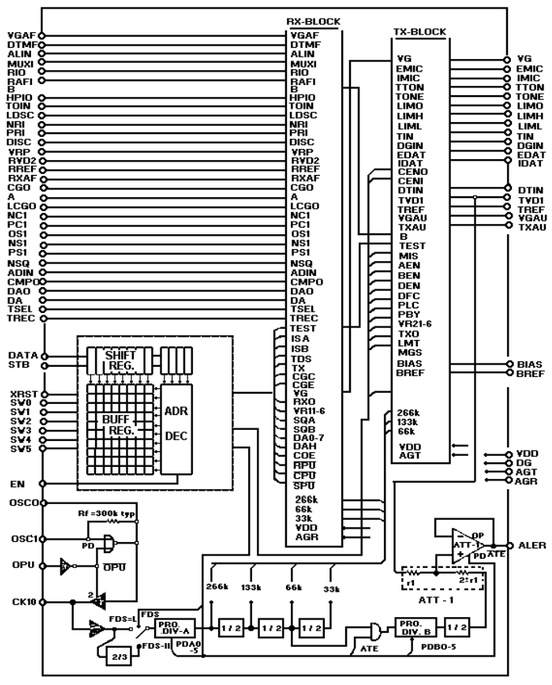


CONTROL LOGIC SECTION

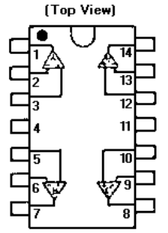
Audio Signal Processor IC601
(SFPM-64V)



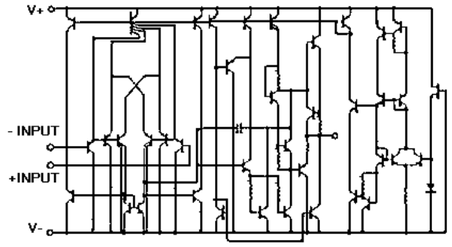
BLOCK DIAGRAM



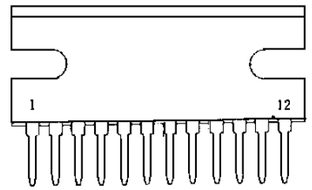
Linear Audio Amplifier IC602, IC603
(NJRC 3403, PC123D)

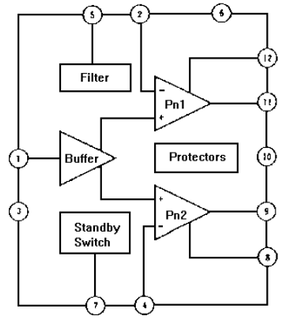


1. A OUTPUT
2. A - INPUT
3. A + INPUT
4. V+
5. B+ INPUT
6. B- INPUT
7. B OUTPUT
8. C OUTPUT
9. C- INPUT
10. C+INPUT
11. V-
12. D+ INPUT
13. D- INPUT
14. D OUTPUT



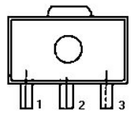
Audio Frequency Power Amplifier IC604
(UPC2500H)

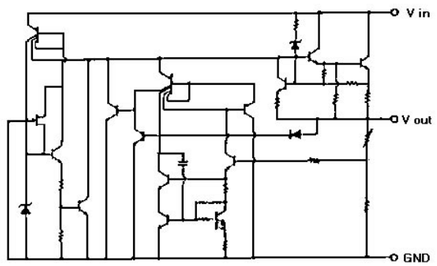




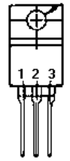
1. INPUT
2. NFB 1
3. GND(INPUT)
4. NFB 2
5. FILTER
6. VCC
7. STAND-BY SW
8. BOOTSTRAP 2
9. OUTPUT 2
10. GND(OUTPUT)
11. OUTPUT 1
12. BOOTSTRAP 1

Linear: Positive Voltage Regulator IC605, IC609
(NJM78L09UA)

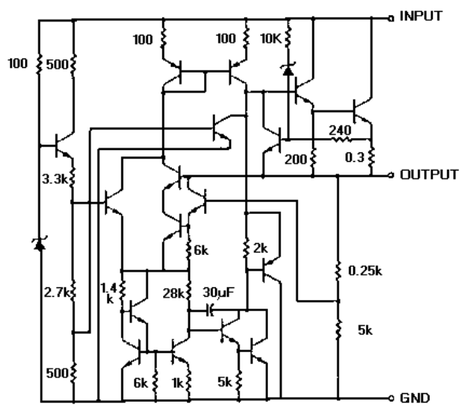




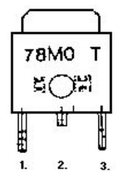
Linear: Positive Voltage Regulator IC606
(MC7805CT)

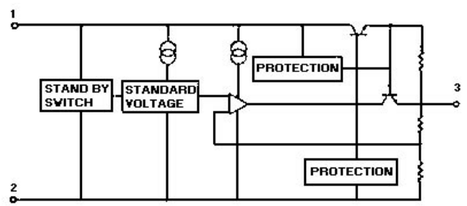


PIN 1. INPUT
2. GROUND
3. OUTPUT

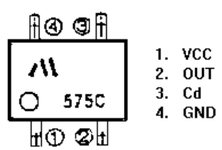


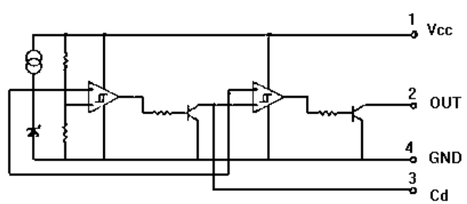
Linear: Positive Voltage Regulator IC607
(L78M05T)





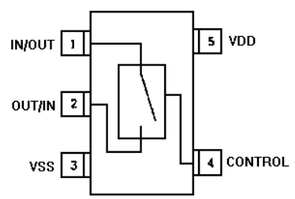
Linear: Positive Voltage Regulator IC608
(L78M09T)

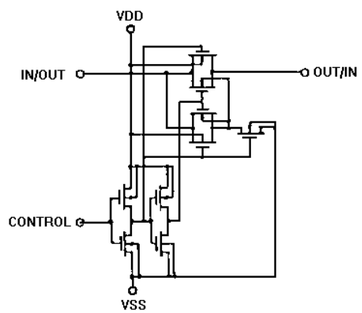




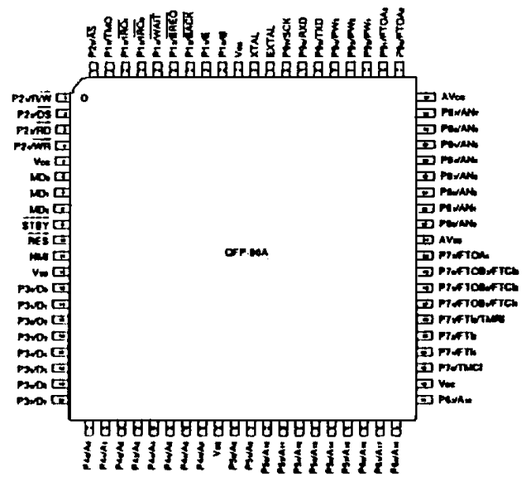
Audio Amplifier IC610
(NJRC 2903)

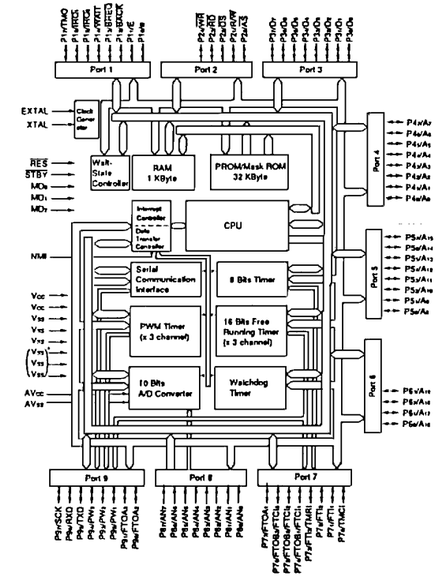
Bilateral Switch IC611, IC612
(TC4S66F)





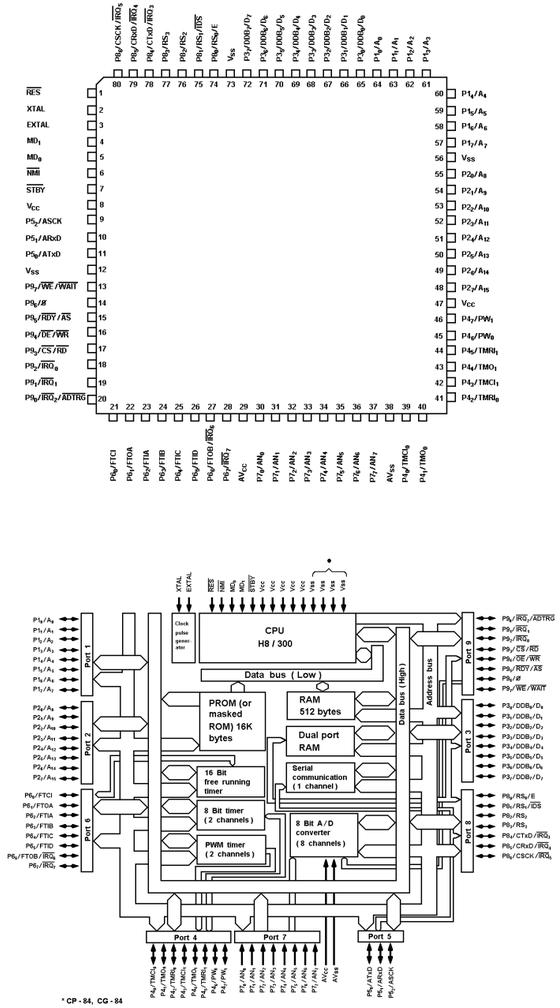
Central Processing Unit IC701
(HD6435328RC72E)



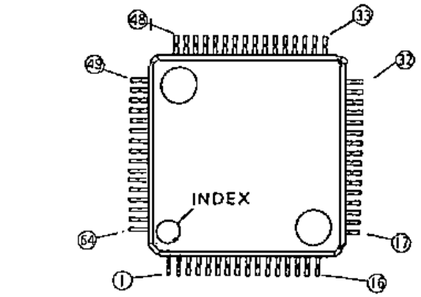


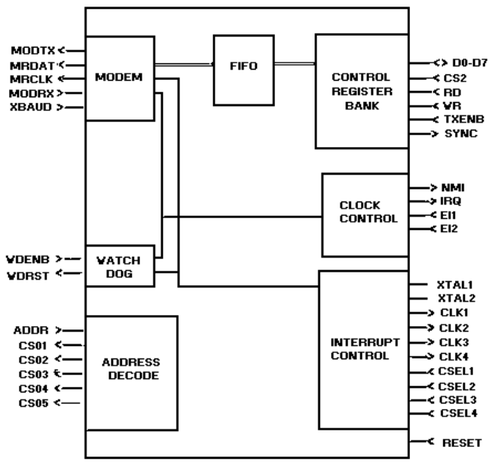
* CP-64 and CG-64 only

Central Processing Unit U702
(HD6433308RR91E)

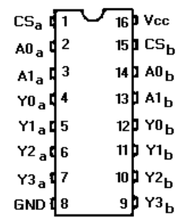


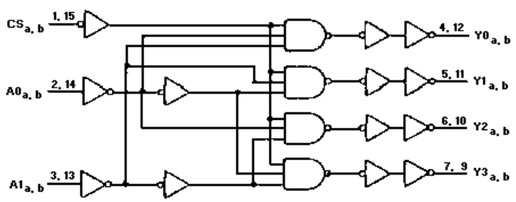
ASIC IC703
(TC245C090AF)



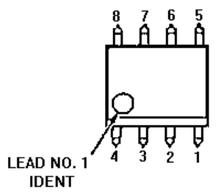


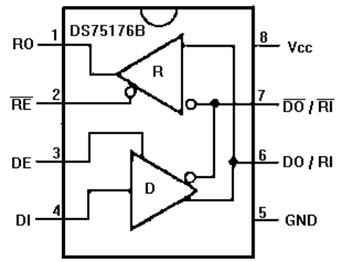
Decoder IC704
(MC74HC139)



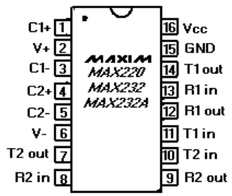


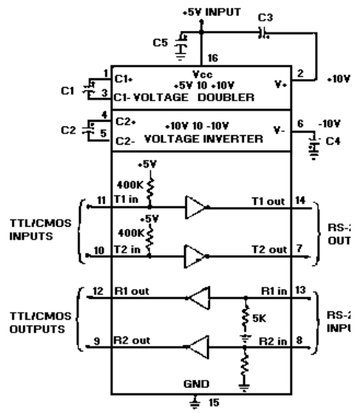
RS-485 Driver/Receiver IC705
(NS AS75176)



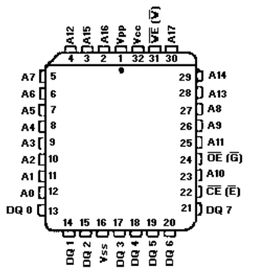


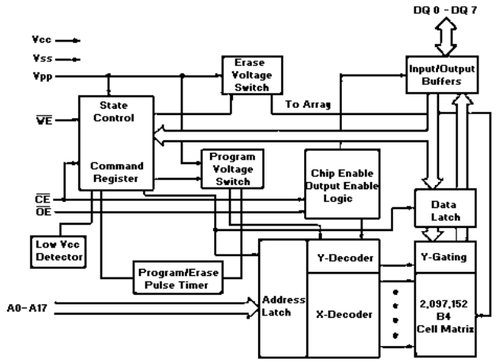
RS-232 Driver/Receiver IC706
(MA232EWE)



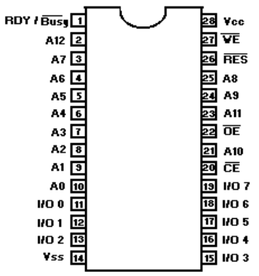


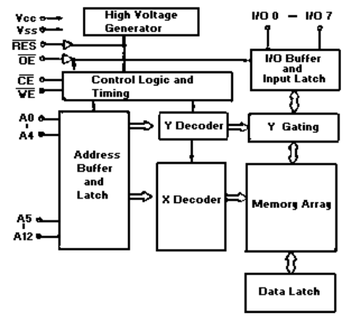
Flash Memory IC707
(N28F020)



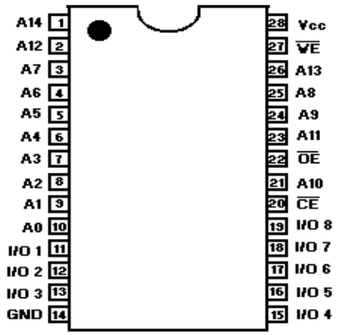


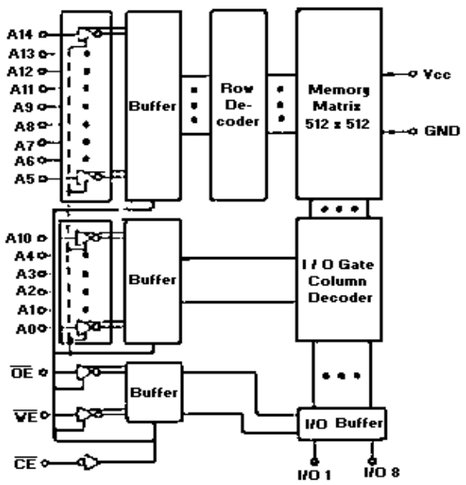
EEPROM IC708
(HN58C66FP)



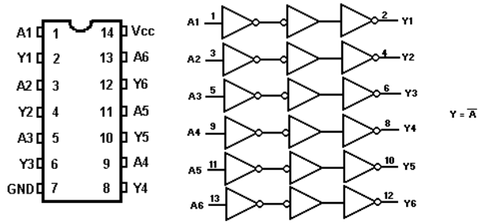


RAM IC709
(TC55257CFL)

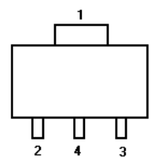




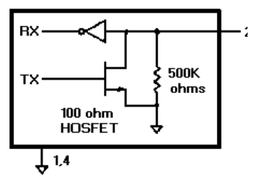
Inverter IC711
(MC74HC04)



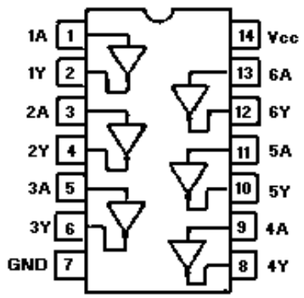
Silicon Seral Number IC712
(DS2401)

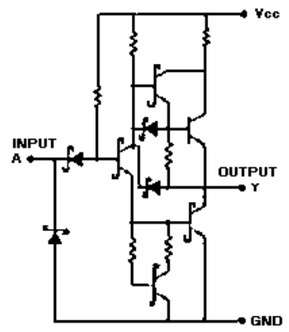


1. GND
2. DATA (DG)
3. NC
4. GND



Inverter IC713
(HD74LS04FP)

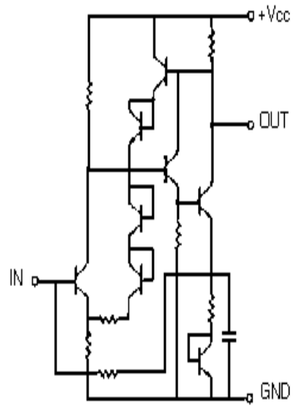




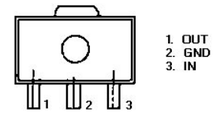
NOISE BLANKER

Linear, Wide Band Amplifier IC1
(NEC PC1658G)

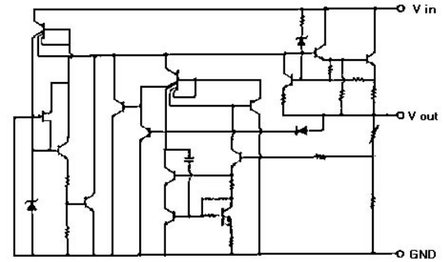
RF Wide Band Amplifier IC2
(NEC PC1675G)



Linear, Positive Voltage Regulator IC3
(NJRC NJM78L09UA)



1. OUT
2. GND
3. IN



CONTROL LOGIC/IF BOARD
LOGIC SECTION CMC-855

SYMBOL	PART NO.	DESCRIPTION
		----------CAPACITORS----------
C601		Ceramic: 0.01 µF 10% 50 VDCW, temp coef ±15%.
C602	NOTE: Parts listed are for reference only.	Ceramic: 1 µF +80%/-20% 16 VDCW, temp coef +30%/-80%.
C603		Ceramic: 220 pF ±5% 50 VDCW, temp coef 0±}30 PPM/_YC
C604		Ceramic: 0.1 µF +80%/-20% 25 VDCW.
C605	Refer to Service Section for serviceable parts	Ceramic: 0.01 µF ±10% 50 VDCW, temp coef ±15%.
C606		Tantalum: 1 µF ±20% 16 VDCW.
C607 thru C609		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C610		Tantalum: 1 µF±20% 16 VDCW.
C611		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C612		Tantalum: 3.3 µF ±20% 16 VDCW.
C613		Tantalum: 1 µF ±20% 16 VDCW.
C614		Tantalum: 0.33 µF ±20% 35 VDCW.
C615		Ceramic: 100 pF ±5% 50 VDCW, temp coef 0±30 PPM/_YC.
C616		Ceramic: 1 µF +80%/-20% 16 VDCW, temp coef +30%/-80%.
C617		Tantalum: 0.33 µF ±20% 35 VDCW.
C618		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C621 and C622		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C623		Tantalum: 22 µF ±20% 16 VDCW.
C624 thru C626		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C627		Tantalum: 22 µF ±20% 16 VDCW.
C628 and C629		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C630		Tantalum: 22 µF ±20% 16 VDCW.
C631 and C632		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C633		Tantalum: 22 µF ±20% 16 VDCW.
C634 thru C637		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C638		Ceramic: 220 pF ±5% 50 VDCW, temp coef 0±30 PPM/_YC
C639		Electrolytic: 47 µF ±20% 25 VDCW.
C640		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C641 and C642		Electrolytic: 22 µF ±20% 16 VDCW.
C643		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C644		Electrolytic: 10 µF ±20% 25 VDCW.
C645		Ceramic: 1 µF +80%/-20% 25 VDCW, temp coef +30%/-80%.
C646		Ceramic: 1000 pF ±10% 50 VDCW, temp coef ±10 %.
C647		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C649 and C650		Electrolytic: 22 µF ±20% 16 VDCW.
C651 and C652		Ceramic: 0.47 µF +80%/-20% 25 VDCW temp coef +30%/-80%.
C653 and C654		Tantalum: 2.2 µF ±20% 16 VDCW.
C655 and C656		Electrolytic: 10 µF ±20% 25 VDCW.
C657 and C658		Ceramic: 0.047 µF 10% 16 VDCW, temp coef 10 %.
C659 and C660		Tantalum: 1 µF 20% 16 VDCW.
C661 thru C664		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C665 and C666		Ceramic: 0.1 µF ±10% 25 VDCW, temp coef ±15%.
C667		Tantalum: 1 µF ±20% 16 VDCW.
C670		Ceramic: 3300 pF ±10% 50 VDCW, temp coef ±15%.
C701 thru C706		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C707		Ceramic: 47 pF ±5% 50 VDCW, temp coef 0±30 PPM/_YC.
C708 and C709		Ceramic: 12 pF ±5% 50 VDCW, temp coef 0±60 PPM/_YC.
C710		Ceramic: 47 pF ±5% 50 VDCW, temp coef 0±30 PPM/_YC.
C711		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C712 and C713		Ceramic: 100 pF ±5% 50 VDCW, temp coef 0±30 PPM/_YC.
C714		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C715 thru C719		Tantalum: 1 µF ±20% 16 VDCW.
C720 thru C722		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C726 and C727		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C728 thru C743		Ceramic: 100 pF }5% 50 VDCW, temp coef 0}30 PPM/_YC.
C744 and C745		Ceramic: 0.1 µF +80%/-20% 25 VDCW, temp coef +22%/-82%.
C746		Ceramic: 1000 pF ±10% 50 VDCW, temp coef ±15%.
C747		Ceramic: 1000 pF ±10% 50 VDCW, temp coef ±10 %.
C748		Ceramic: 470 pF ±5% 50 VDCW, temp coef 0±30 PPM/_YC.
		----------DIODES----------
CD601 and CD602		POWER Supply rectification diode: sim to SANKEN SFPM-64V.
CD604 and' CD605		Silicon fast recovery (2 diodes in series): sim to TOSHIBA ISS300
CD606		Zener 900 mW 22 V: sim to HITACHI HZF22.
CD701 thru CD705		Silicon fast recovery (2 diodes in series):sim to TOSHIBA ISS302
CD709 and CD710		Silicon fast recovery (2 diodes in series):sim to TOSHIBA ISS302.
CD711		Silicon fast recovery (2 diodes in series):sim to TOSHIBA ISS300
CD712		Zener 500 mW 12 V: sim to HITACHI HZK12.
		------FILTER-----
CX701 and CX702		EMI Filter.
		--------FUSE-------
F601		Fuse: 5A.
		---INTEGRATED CIRCUITS ----
IC601		Audio Signal PROCESSOR.
IC602 and IC603		Linear; Audio Amplifier: sim to NJRC 3403.
IC604		AF Power Amplifier: sim to NEC UPC2500H.
IC605		Linear; Positive Voltage Regulator: sim to NJRC NJM78L09UA.
IC606		Linear; Positive Voltage Regulator: sim to MOTOROLA MCT7805CT.
IC607		Linear; Positive Voltage Regulator: sim to SANYO L78M05T.
IC608		Linear; Positive Voltage Regulator: sim to SANYO L78M09T.
IC609		Linear; Positive Voltage Regulator: sim to NJRC NJM78L09UA.
IC610		Linear; Audio Amplifier: sim to NJRC 2903.
IC611 and IC612		Bilateral Switch: sim to TOSHIBA TC4S66F.
IC701		MASKCPU: HITACHI HD6435328RC72E.
IC702		MASKCPU: HITACHI HD6433308RR91E.
IC703		ASIC: sim to TOSHIBA TC24SC090AF.
IC704		DECODER: Sim to MOTOROLA MC74HC139.
IC705		RS485 Driver/Receiver: sim to NS DS75176.
IC706		RS232 Driver/Receiver: sim to MAXIM MAX232EWE.
IC707		FLASH MEMORY: sim to INTEL N28F020.
IC708		EEPROM: sim to HITACHI HN58C66FP.
IC709		RAM: sim to TOSHIBA TC55257CFL.
IC711		Inverter: sim to MOTOROLA MC74HC04.
IC712		Silicon Serial Number: sim to DALLAS DS2401.
IC713		Inverter: sim to HITACHI HD74LS04FP.
		----------JACKS----------
J702		Connector: 40 pins.
J704		Connector: 8 pins.
J706		Connector: 10 pins.
J707		Connector: 13 pins.
J708		Connector: 5 pins.
K601		Relay: sim to TAKAMIZAWA JY9H-K.
		----------RESISTORS---------
R601		Metal film: 15k ohms ±5% 100 VDCW 1/16W.
R602		Metal film: 33K ohms ±5% 100 VDCW 1/16W.
R603		Metal film: 68k ohms ±5% 100 VDCW 1/16W.
R604		Metal film: 120K ohms ±5% 100 VDCW 1/16W.
R605		Metal film: 270K ohms ±5% 100 VDCW 1/16W.
R606		Metal film: 56K ohms ±5% 100 VDCW 1/16W.
R607		Metal film: 150K ohms ±5% 100 VDCW 1/16W.
R608 and R609		Metal film: 680 ohms ±5% 100 VDCW 1/16W.
R610 and R611		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R612 and R613		Metal film: 39k ohms ±5% 100 VDCW 1/16W.
R614		Metal film: 4.7k ohms ±5% 100 VDCW 1/16W.
R615		Metal film: 100k ohms ±5% 100 VDCW 1/16W.
R616		Metal film: 470K ohms ±5% 100 VDCW 1/16W.
R617		Metal film: 3.3M ohms ±10% 200 VDCW 1/10W.
R618 and R619		Metal film: 100k ohms ±5% 100 VDCW 1/16W.
R620		Metal film: 47K ohms ±5% 100 VDCW 1/16W.
R621		Metal film: 22k ohms ±5% 100 VDCW 1/16W.
R622 thru R624		Metal film: 56K ohms ±5% 100 VDCW 1/16W.
R625		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R626		Metal film: 56k ohms ±5% 100 VDCW 1/16W.
R627		Metal film: 150k ohms ±5% 100 VDCW 1/16W.
R628 and R629		Metal film: 100K ohms ±5% 100 VDCW 1/16W.
R630		Metal film: 3.3M ohms ±10% 200 VDCW 1/10W.
R631		Metal film: 47k ohms ±5% 100 VDCW 1/16W.
R632		Metal film: 100K ohms ±5% 100 VDCW 1/16W.
R633		Metal film: 22k ohms ±5% 100 VDCW 1/16W.
R634		Metal film: 1M ohms ±5% 100 VDCW 1/16W.
R635		Metal film: 6.8k ohms ±5% 100 VDCW 1/16W.
R636 thru R639		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R640		Metal film: 3.3k ohms ±5% 100 VDCW 1/16W.
R641		Metal film: 330k ohms ±5% 100 VDCW 1/16W.
R642		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R643 and R644		Metal film: 22 ohms ±5% 100 VDCW 1/16W.
R645 and R646		Metal film: 1.0k ohms ±5% 100 VDCW 1/16W.
R647		Metal film: 8.2k ohms ±5% 100 VDCW 1/16W.
R648		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R649		Metal film: 1M ohms ±5% 100 VDCW 1/16W.
R650 and R651		Metal film: 680 ohms ±5% 100 VDCW 1/16W.
R652 thru R654		Metal film: 15K ohms ±5% 100 VDCW 1/16W.
R655		Metal film: 56k ohms ±5% 100 VDCW 1/16W.
R656		Metal film: 1.0k ohms ±5% 100 VDCW 1/16W.
R657		Metal film: 560 ohms ±5% 100 VDCW 1/16W.
R658		Metal film: 15k ohms ±5% 100 VDCW 1/16W.
R659		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R660		Metal film: 5.6k ohms ±5% 100 VDCW 1/16W.
R661		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R662		Metal film: 15k ohms ±5% 100 VDCW 1/16W.
664		Metal film: 2.2k ohms ±5% 100 VDCW 1/16W.
R665 and R666		Metal film: 0 ohms.
R701 thru R703		Metal film: 100 ohms ±5% 100 VDCW 1/16W.
R704		Metal film: 68k ohms ±5% 100 VDCW 1/16W.
R705		Metal film: 100 ohms ±5% 100 VDCW 1/16W.
R706 and R707		Metal film: 1.0k ohms ±5% 100 VDCW 1/16W.
R709 and R710		Metal film: 100 ohms ±5% 100 VDCW 1/16W.
R718		Metal film: 4.7k ohms ±5% 100 VDCW 1/16W.
R719		Metal film: 100k ohms ±5% 100 VDCW 1/16W.
R720		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R724 and R725		Metal film: 2.7K ohms ±5% 100 VDCW 1/16W.
R726		Metal film: 1M ohms ±5% 100 VDCW 1/16W.
R729		Metal film: 0 ohms.
R732		Metal film: 0 ohms.
R733		Metal film: 4.7K ohms ±5% 100 VDCW 1/16W.
R734		Metal film: 1.0k ohms ±5% 100 VDCW 1/16W.
R735		Metal film: 4.7K ohms ±5% 100 VDCW 1/16W.
R736		Metal film: 6.8K ohms ±5% 100 VDCW 1/16W.
R737 thru R740		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
R741		Metal film: 27k ohms ±5% 100 VDCW 1/16W.
R742 and R743		Metal film: 4.7K ohms ±5% 100 VDCW 1/16W.
R744 and R745		Metal film: 100k ohms ±5% 100 VDCW 1/10W.
R747		Metal film: 0 ohms.
R748		Metal film: 10K ohms ±5% 100 VDCW 1/16W.
R749		Metal film: 100K ohms ±5% 100 VDCW 1/16W.
R750 and R751		Metal film: 22k ohms ±5% 100 VDCW 1/16W.
R752 and R753		Metal film: 10k ohms ±5% 100 VDCW 1/16W.
		--------SWITCH-------
SW601		Slide Switch.
		-----TRANSISTORS----
TR602		Transistor NPN: sim to SANYO 2SC3398.
TR603		Transistor NPN: sim to NEC 2SD596.
TR701		Transistor PNP: sim to TOSHIBA RN2301.
TR702 thru TR706		FET: sim to NEC 2SK1582.
TR708 thru TR712		FET: sim to NEC 2SK1582.
TR713 and TR714		Transistor NPN: sim to TOSHIBA 2SC2859.

*COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NO.	DESCRIPTION
TR715 and TR716		FET: sim to SANYO 2SK1467.
TR717		FET: sim to NEC 2SK1582.
		-------CRYSTAL------
X701		Crystal: 9.8304 MHz CP12A.

CONTROL LOGIC/IF BOARD
20.8 MHz IF SECTION

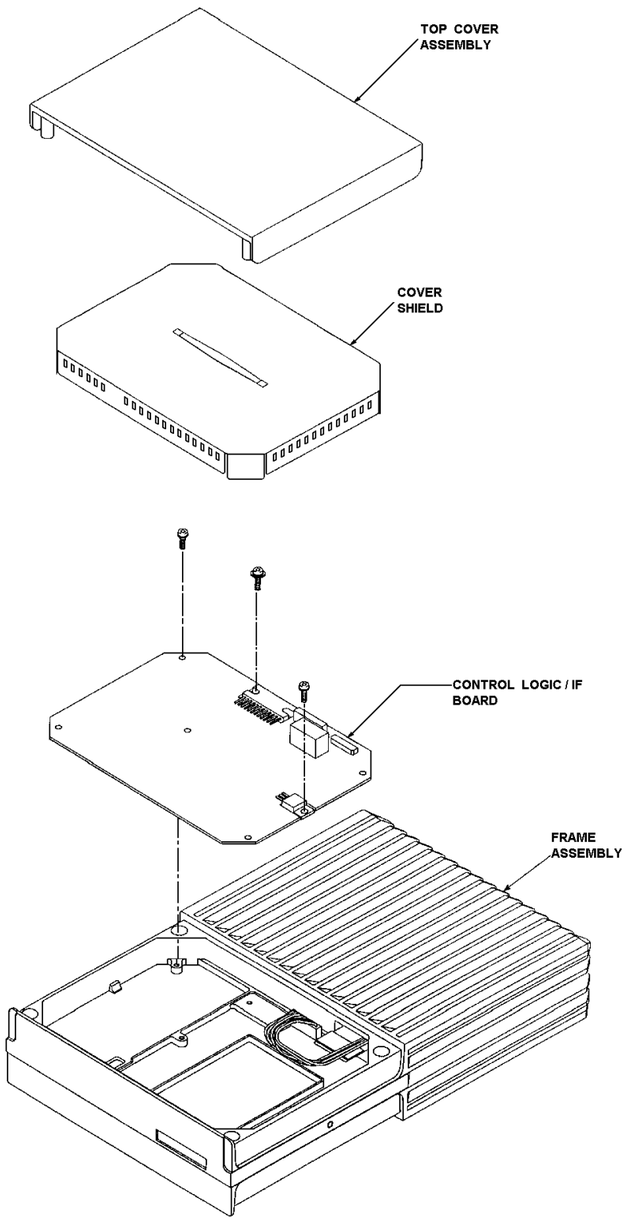
SYMBOL	PART NO.	DESCRIPTION
		--------CAPACITORS--------
C501 and C502	NOTE: Parts listed are for reference only. Refer to Service Section for serviceable parts	Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C504 and C505		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C506		Ceramic: 390pF ±5% 50 VDCW temp coef 0±60 PPM.
C507		Ceramic: 82pF ±5% 50 VDCW temp coef 0±60 PPM.
C508		Ceramic: 2pF ±0.25 pF 50 VDCW temp coef 0±60 PPM.
C509 and C510		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C511		Ceramic: 27 pF ±5% 50 VDCW temp coef 0±60 PPM.
C512		Ceramic: 22pF ±5% 50 VDCW temp coef 0±60 PPM.
C513		Ceramic: 2pF ±0.25 pF 50 VDCW temp coef 0±60 PPM.
C515		Ceramic: 33pF ±5% 50 VDCW temp coef 0±60 PPM.
C516		Ceramic: 120pF ±5% 50 VDCW temp coef 0±60 PPM.
C517 thru C519		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C520		Ceramic: 33pF ±5% 50 VDCW temp coef 0±60 PPM.
C521		Ceramic: 2pF ±0.25 pF 50 VDCW temp coef 0±60 PPM.
		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C523		Ceramic: 33pF ±5% 50 VDCW temp coef 0±60 PPM.
C524 and C525		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C526		Ceramic: 22pF ±5% 50 VDCW temp coef 0±60 PPM.
C527		Ceramic: 100pF ±5% 50 VDCW temp coef 0±60 PPM.
C528		Ceramic: 5pF ±0.25 pF 50 VDCW temp coef 0±60 PPM.
C529		Ceramic: 100pF ±5% 50 VDCW temp coef 0±60 PPM.
C531		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C532 and C533		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C534		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C535 thru C544		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C545		Ceramic: 8pF ±0.5 pF 50 VDCW temp coef 0±60 PPM.
C550		Ceramic: 0.01µF ±10% 50 VDCW temp coef 0±15%.
C551 thru C554		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C555		Ceramic: 0.01µF ±10% 50 VDCW temp coef ±15%.
C556 thru C558		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C559		Ceramic: 15pF ±5% 50 VDCW temp coef 0±60 PPM.
C560		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C561		Ceramic: 1000pF ±10% 50 VDCW temp coef ±15%.
C562 and C563		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C564		Elerctrolytic: 10µF ±20% 16 VDCW.
C571 and C572		Ceramic: 0.1µF ±10% 25 VDCW temp coef ±15%.
C573		Elerctrolytic: 10µF ±20% 16 VDCW.
		----------DIODES----------
CD502 and CD503		Silicon fast recovery sim to HITACHI HSU277.

SYMBOL	PART NO.	DESCRIPTION
		----------FILTERS----------
FL501 and FL502		Crystal Filter: 20.8 MHz.
FL503		Ceramic Filter: 455 KHz.
FL504		Ceramic Filter: 455 KHz.
		----INTEGRATED CIRCUITS---
IC501		Linear: IF Amplifier/Detector; sim to TOSHIBA TA31132F.
IC502		Linear: Dual OP AMP; sim to JRC NJM3404.
IC503		Linear: Positive Voltage Regulator; sim to JRC NJM78L06UA.
		----------CONNECTORS---------
J501 thru J503		Connector: 5 pins.
		----------COILS----------
L501		Coil: RF 1 µH .
L502		Coil: RF 3.3 µH .
L504		Coil: RF .
L505		Coil: RF .
L506		Coil: RF .
L509		Coil: RF .
L511 and L512		Coil: RF .
L514		Coil: RF .
		----------CONNECTORS---------
P501		Connector: 20 Pins.
		----------RESISTOR----------
R501		Metal film: 82 ohms ±5% 100 VDCW. 1/10W.
R502		Metal film: 2.2K ohms ±5% 100 VDCW. 1/16W.
R504		Metal film: 10K ohms ±5% 100 VDCW. 1/16W.
R505		Metal film: 680 ohms ±5% 100 VDCW. 1/16W.
R506		Metal film: 15K ohms ±5% 100 VDCW. 1/16W.
R507		Metal film: 1.5K ohms ±5% 100 VDCW. 1/16W.
R508		Metal film: 10K ohms ±5% 100 VDCW. 1/16W.
R510		Metal film: 15K ohms ±5% 100 VDCW. 1/16W.
R511		Metal film: 1.5K ohms ±5% 100 VDCW. 1/16W.
R513		Metal film: 3.3K ohms ±5% 100 VDCW. 1/16W.
R514		Metal film: 150K ohms ±5% 100 VDCW. 1/16W.
R515		Metal film: 330 ohms ±5% 100 VDCW. 1/16W.
R516		Metal film: 470 ohms ±5% 100 VDCW. 1/16W.
R517		Metal film: 220 ohms ±5% 100 VDCW. 1/16W.
R519		Metal film: 3.9K ohms ±5% 100 VDCW. 1/16W.
R520		Metal film: 100 ohms ±5% 100 VDCW. 1/16W.
R521		Metal film: 10K ohms ±5% 100 VDCW. 1/16W.
R522		Metal film: 10K ohms ±5% 100 VDCW. 1/16W.
R523		Metal film: 4.7K ohms ±5% 100 VDCW. 1/16W.
R524		Metal film: 1.5K ohms ±5% 100 VDCW. 1/16W.
R525		Metal film: 15K ohms ±5% 100 VDCW. 1/16W.
R526		Metal film: 4.7K ohms ±5% 100 VDCW. 1/16W.
R527		Metal film: 100 ohms ±5% 100 VDCW. 1/16W.
R528		Metal film: 33 ohms ±5% 100 VDCW. 1/16W.
R529		Metal film: 1K ohms ±5% 100 VDCW. 1/16W.
R530		Metal film: 1.5K ohms ±5% 100 VDCW. 1/16W.
R531		Metal film: 4.7K ohms ±5% 100 VDCW. 1/16W.
R532		Metal film: 33 ohms ±5% 100 VDCW. 1/16W.
R533		Metal film: 820 ohms ±5% 100 VDCW. 1/16W.
R534		Metal film: 4.7K ohms ±5% 100 VDCW. 1/16W.
R535		Metal film: 100 ohms ±5% 100 VDCW. 1/16W.
R536		Metal film: 47 ohms ±5% 100 VDCW. 1/16W.
R537		Metal film: 4.7K ohms ±5% 100 VDCW. 1/16W.
R538		Metal film: 5.6K ohms ±5% 100 VDCW. 1/16W.
R539		Metal film: 100K ohms ±5% 100 VDCW. 1/16W.
R550 thru R552		Metal film: 1.5K ohms ±5% 100 VDCW. 1/16W.
R553		Metal film: 820 ohms ±5% 100 VDCW. 1/16W.
R554		Metal film: 18K ohms ±5% 100 VDCW. 1/16W.
R556		Metal film: 10K ohms ±5% 100 VDCW. 1/16W.
R557		Metal film: 5.6K ohms ±5% 100 VDCW. 1/16W.
R558		Metal film: 0 ohms .
R559		Metal film: 1.2K ohms ±5% 100 VDCW. 1/16W.
R560		Metal film: 6.8K ohms ±5% 100 VDCW. 1/16W.
R721		Metal film: 1K ohms ±5% 100 VDCW. 1/16W.
RV501		Variable: 10K ohms.
		----------TRANSISTORS----------
TR501 thru TR506		N-Channel, field effect(Junction Single Gate); 2SK520.
TR507		Silicon, NPN; sim to NEC 2SC2223.
TR508 and TR509		Silicon, NPN; sim to HITACHI 2SC2620.
		------------CRYSTALS------------
X501		Quartz crystal: 20.345 MHz.
XS501A and XS501B		Crystal Socket.

NOISE BLANKER
CFG-139
(Optional)

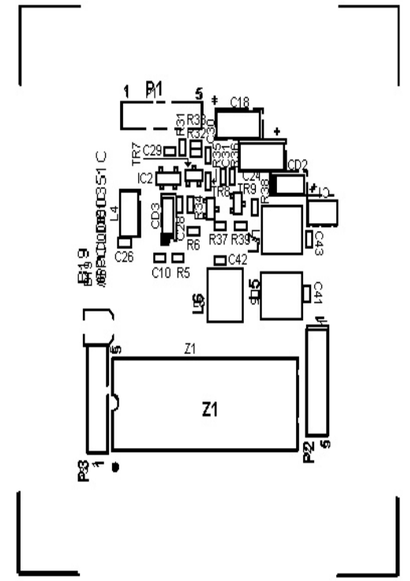
SYMBOL	PART NO.	DESCRIPTION
		----------CAPACITORS----------
C1		Tantalum: 2.2 µF ±20%, 20 VDCW.
C3 and C4	NOTE: Parts listed are for reference only. Refer to Service Section for serviceable parts	Ceramic: 0.01µF ±10%, 50 VDCW, temp coef ±15%.
C5		Ceramic: 15pF ±5%, 50 VDCW, temp coef 0±60PPM.
C6		Ceramic: 0.01µF ±10%, 50 VDCW, temp coef ±15%.
C7		Ceramic: 10pF ±5pF, 50 VDCW, temp conf 0±60PPM
C8		Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0±60PPM.
C9		Ceramic: 0.01µF ±10%, 50 VDCW, temp coef ±15%.
C10		Ceramic: 1000pF ±10%, 50 VDCW, temp coef ±15%.
C11 thru C14		Ceramic: 0.01µF ±10%, 50 VDCW,,temp coef ±15%.
C15		Ceramic: 4700 pF ±10%, 50 VDCW, temp coef ±15%.
C16		Ceramic: 470 pF ±5%, 50 VDCW, temp coef 0±60PPM.
C17		Ceramic: 0.1µF ±10%, 25 VDCW, temp ±15%.
C18		Tantalum: 10µF ±20%, 16 VDCW.
C19		Ceramic: 15pF ±5%, 50 VDCW, temp coef 0±60PPM
C20		Ceramic: 470pF ±5%, 50 VDCW, temp coef 0±60PPM
C21		Ceramic: 0.01µF ±10%, 50 VDCW, temp coef ±15%.
C22		Ceramic: 2200pF ±10%, 50 VDCW, temp coef ±15%.
C23		Ceramic: 820pF ±10%, 50 VDCW, temp coef ±10%.
C24		Tantalum: 10µF ±20%, 16 VDCW.
C25		Ceramic: 4700pF ±10%, 50 VDCW, temp coef ±15%.
C26 thru C30		Ceramic: 0.01µF ±10%, 50 VDCW, temp coef ±15%.
C31		Ceramic: 0.047µF ±10%, 50 VDCW, temp coef ±15%.
C41		Ceramic: 270pF ±5%, 50 VDCW, temp coef 0±60PPM.
C42		Ceramic: 27 pF ±5%, 50 VDCW, temp coef 0±60PPM.
C43		Ceramic: 270pF ±5%, 50 VDCW, temp coef 0±60PPM.
C44		Ceramic: 0.01µF ±10%, 50 VDCW, temp coef ±15%.
C45		Ceramic: 0.1µF ±10%, 25 VDCW, temp coef ±15%.
C46		Tantalum: 2.2µF ±20%, 20 VDCW.
C47		Ceramic: 0.1µF ±10%, 25 VDCW, temp coef ±15%.
		--------DIODES--------
CD1		Silicon, rectifier: sim to NEC 1S2838.
CD2		Silicon, RF switching: sim to MITSUBISHI MI309.
CD3		Zener: 3.0V; sim to HITACHI HZK3B.
CD4		Silicon: fast recovery (2 diodes in cathode) sim to TOSHIBA 1SS184.
		---INTEGRATED CIRCUITS---
IC1		Linear, Wide band amplifier: sim to NEC uPC1658G
IC2		RF Wide band amplifier: sim to NEC uPC1675G.

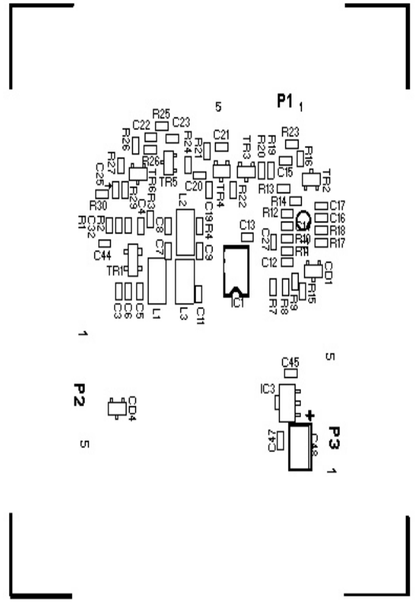
SYMBOL	PART NO.	DESCRIPTION
IC3		Linear, Positive Voltage Regulator: sim to NJRC NJM78L09UA
		---------COILS--------
L1		Coil: RF 2.2µH ±10%.
L2		Coil: RF 1.5µH ±10%.
L3		Coil: RF 560nH ±20%.
L4		Choke Coil:330µH ±10%.
L5		Coil: RF.
L6		Coil: RF.
L7		Coil: RF.
		----------JACKS---------
P1 thru P3		Connector.
		------RESISTORS------
R1		Metal film: 5.6K ohms ±5%, 100 VDCW, 1/16W.
R2		Metal film: 3.9K ohms ±5%, 100 VDCW, 1/16W.
R3		Metal film: 220 ohms ±5%, 100 VDCW, 1/16W.
R5		Metal film: 390 ohms ±5%, 100 VDCW, 1/16W.
R7		Metal film: 120 ohms ±5%, 100 VDCW, 1/16W.
R9		Metal film: 51 ohms ±5%, 100 VDCW, 1/16W.
R10		Metal film: 0 ohms, 1/16W.
R11		Metal film: 220 ohms ±5%, 100 VDCW, 1/16W.
R12		Metal film: 33K ohms ±5%, 100 VDCW, 1/16W.
R13		Thermistor.
R14		Metal film: 12K ohms ±5%, 100 VDCW, 1/16W.
R15		Metal film: 100 ohms ±5%, 100 VDCW, 1/16W.
R16		Metal film: 5.6K ohms ±5%, 100 VDCW, 1/16W.
R17 and R18		Metal film: 150 ohms ±5%, 100 VDCW, 1/16W.
R19		Metal film: 1.8K ohms ±5%, 100 VDCW, 1/16W.
R20		Metal film: 2.2K ohms ±5%, 100 VDCW, 1/16W.
R21		Metal film: 8.2K ohms ±5%, 100 VDCW, 1/16W.
R22		Metal film: 220 ohms ±5%, 100 VDCW, 1/16W.
R23 and R24		Metal film: 10K ohms ±5%, 100 VDCW, 1/16W.
R25		Metal film: 560 ohms ±5%, 100 VDCW, 1/16W.
R26		Metal film: 680 ohms ±5%, 100 VDCW, 1/16W.
R27		Metal film: 68 ohms ±5%, 100 VDCW, 1/16W.
R28		Metal film: 1K ohms ±5%, 100 VDCW, 1/16W.
R29		Metal film: 10K ohms ±5%, 100 VDCW, 1/16W.
R30		Metal film: 180 ohms ±5%, 100 VDCW, 1/16W.
R32		Metal film: 0 ohms, 1/16W.
R34		Metal film: 100K ohms ±5%, 100 VDCW, 1/16W.
R35		Metal film: 1K ohms ±5%, 100 VDCW, 1/16W.
R36		Metal film: 33K ohms ±5%, 100 VDCW, 1/16W.
R37		Metal film: 4.7K ohms ±5%, 100 VDCW, 1/16W.
R38		Metal film: 0 ohms, 1/16W.
R39		Metal film: 100K ohms ±5%, 100 VDCW, 1/16W.
		----TRANSISTORS----
TR1		N-channel dual gate (MOS FET) : sim to NEC 3SK132A.
TR2		Silicon, NPN: Sim to NEC 2SC3734.
TR3 and TR4		Silicon, PNP: sim to NEC 2SA1461.
TR5		Silicon, NPN: sim to NEC 2SC3734.
TR6 thru TR9		Silicon, PNP: sim to NEC 2SA1461.
		----DELAY CIRCUIT----
Z1		Delay Line : sim to JPC SDL300-201-24SF.



ORION LOW BAND

Control Logic/If Board
With Noise Blanker

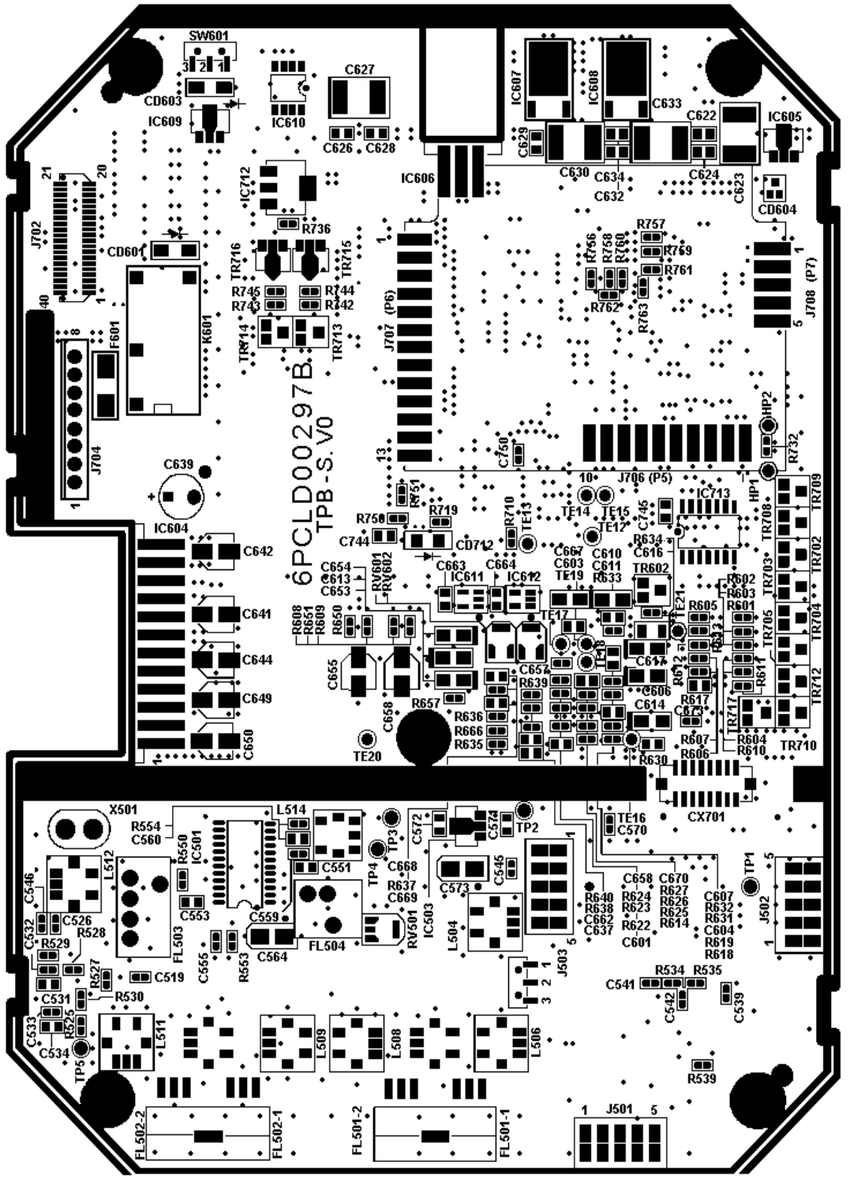




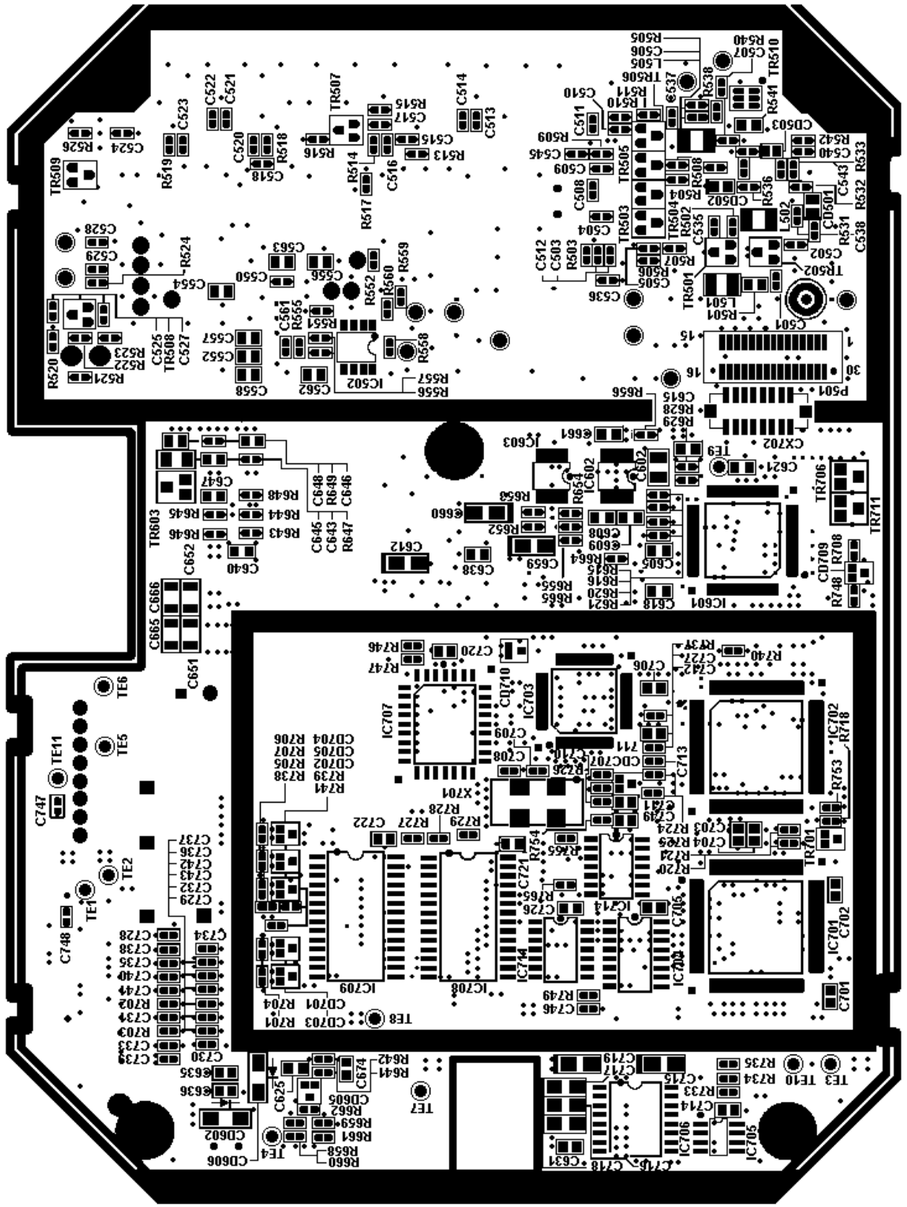
ORION LOW BAND
Noise Blanker

(6PCLD00351C)

COMPONENT SIDE

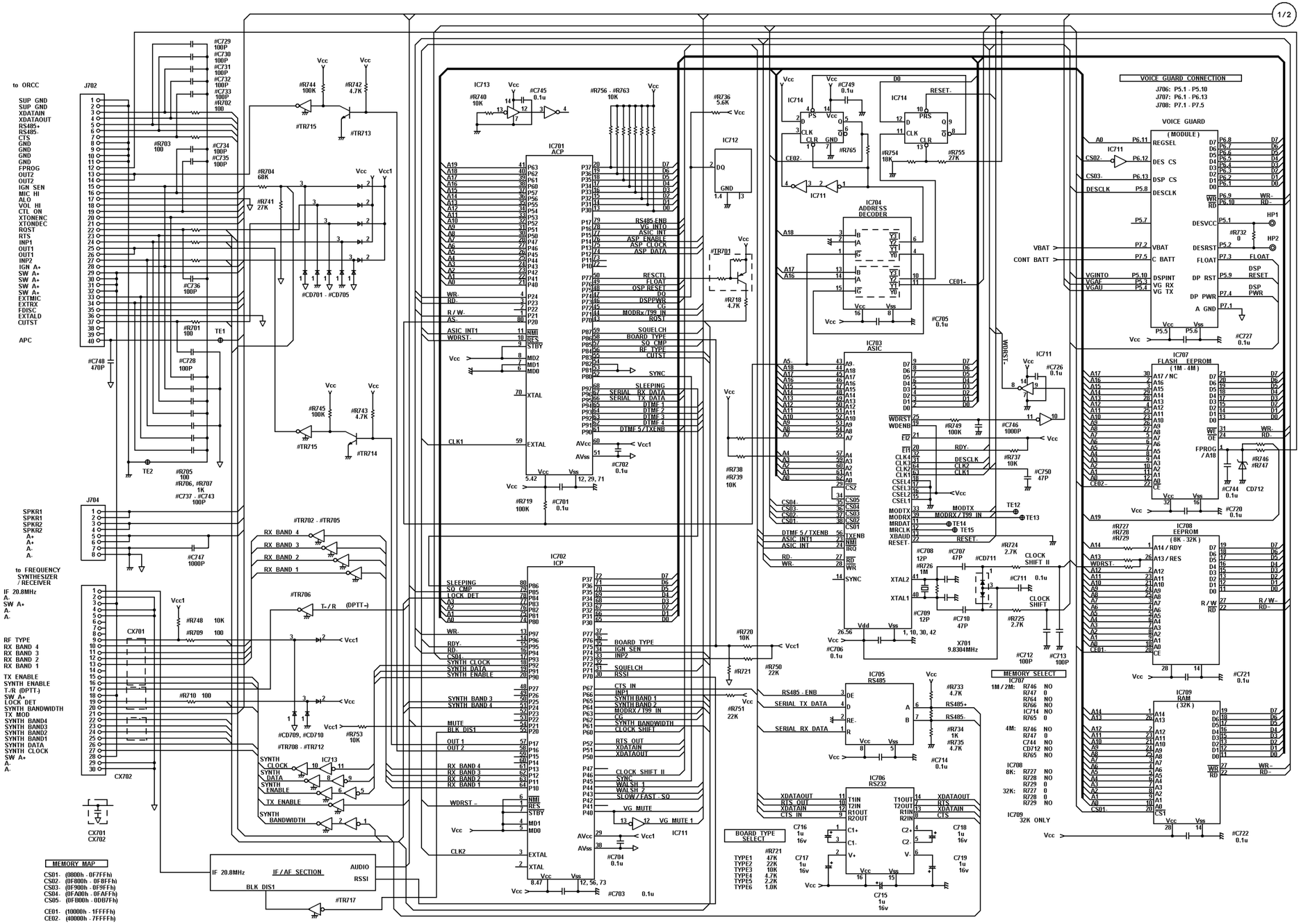


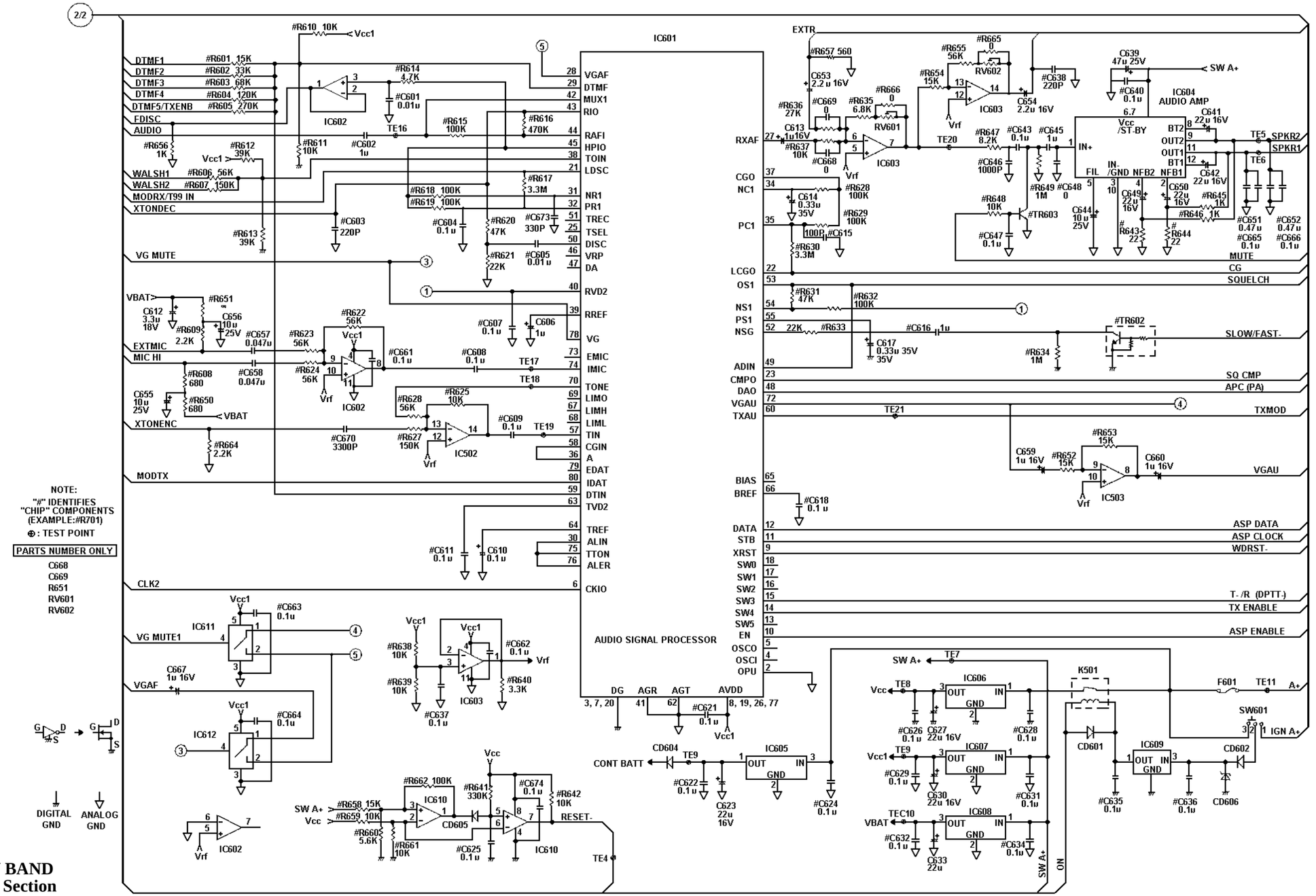
SOLDER SIDE



ORION LOW BAND
Control Logic/If Board

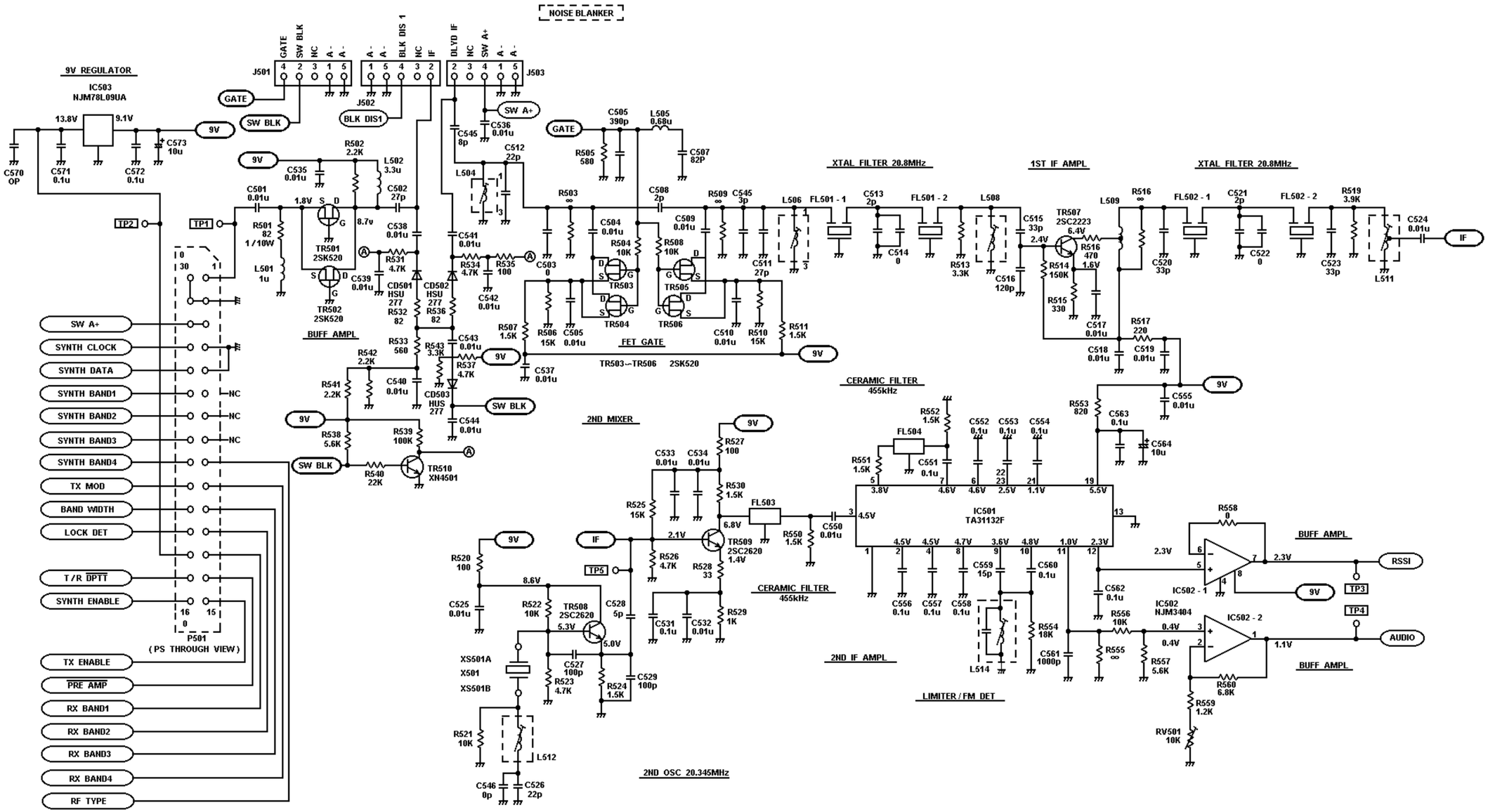
(6PCLD00297B)


1/2
to ORCC
SUP GND
SUP GND
XDATAIN
XDATAOUT
RS485+
RS485-
CTS
GND
GND
GND
GND
FPROG
OUT2
OUT2
IGN SEN
MIC HI
ALO
VOL HI
CTL ON
XTONENC
XTONDEC
RQST
RTS
INP1
OUT1
OUT1
INP2
IGN A+
SW A+
SW A+
SW A+
SW A+
EXTMIC
EXTRX
FDISC
EXTALD
CUTST
APC
SPKR1
SPKR1
SPKR2
SPKR2
A-
A+
A-
A-
to FREQUENCY SYNTHESIZER / RECEIVER
IF 20.8MHz
A-
SW A+
A-
A-
RF TYPE
RX BAND 4
RX BAND 3
RX BAND 2
RX BAND 1
TX ENABLE
SYNTH ENABLE
T-/R (DPTT-)
SW A+
LOCK DET
SYNTH BANDWIDTH
TX MOD
SYNTH BAND4
SYNTH BAND3
SYNTH BAND2
SYNTH BAND1
SYNTH DATA
SYNTH CLOCK
SW A+
A-
A-
J702
J704
CX701
CX702
IC701 ACP
IC702 ICP
IC703 ASIC
IC704 ADDRESS DECODER
IC705 RS485
IC706 RS232
IC707 FLASH EEPROM (1M - 4M)
IC708 EEPROM (8K - 32K)
IC709 RAM (32K)
IC711
IC712
IC713
IC714
VOICE GUARD CONNECTION
J706: P5.1 - P5.10
J707: P6.1 - P6.13
J708: P7.1 - P7.5
VOICE GUARD (MODULE)
MEMORY MAP
CS01- (0800h - 0F7FFh)
CS02- (0F800h - 0F8FFh)
CS03- (0F900h - 0F9FFh)
CS04- (0FA00h - 0FAFFh)
CS05- (0FB00h - 0DB7Fh)
CE01- (10000h - 1FFFFh)
CE02- (40000h - 7FFFFh)
MEMORY SELECT
BOARD TYPE SELECT
IF 20.8MHz
IF / AF SECTION
AUDIO
RSSI
BLK DIS1
ORION LOW BAND
Control Logic Section
(DD00-CMC-855 1/2)



ORION LOW BAND
Control Logic Section

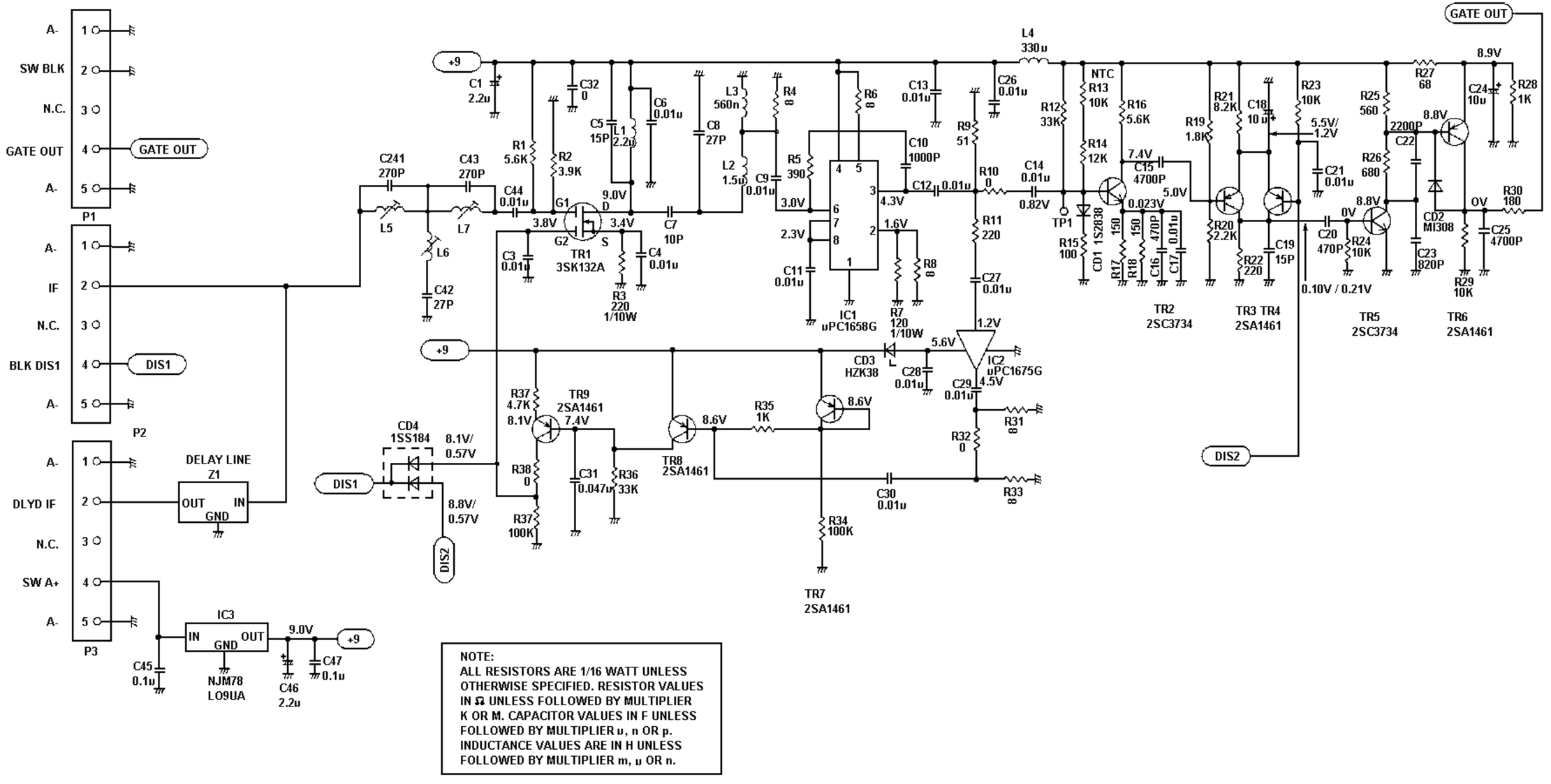
(DD00-CMC-855-2/2)



NOTE:
ALL RESISTORS ARE 1/16 WATT UNLESS OTHERWISE SPECIFIED.
RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER K OR M.
CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER u OR P.
INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER u OR n.

ORION LOW BAND
20.8 MHz IF Section (CMF-132)

(DD00-CMF-132)



NOTE:
ALL RESISTORS ARE 1/16 WATT UNLESS OTHERWISE SPECIFIED. RESISTOR VALUES IN Ω UNLESS FOLLOWED BY MULTIPLIER K OR M. CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER µ, n OR p. INDUCTANCE VALUES ARE IN H UNLESS FOLLOWED BY MULTIPLIER m, µ OR n.

ORION LOW BAND
Noise Blanker

(DD00-CFR-138)

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