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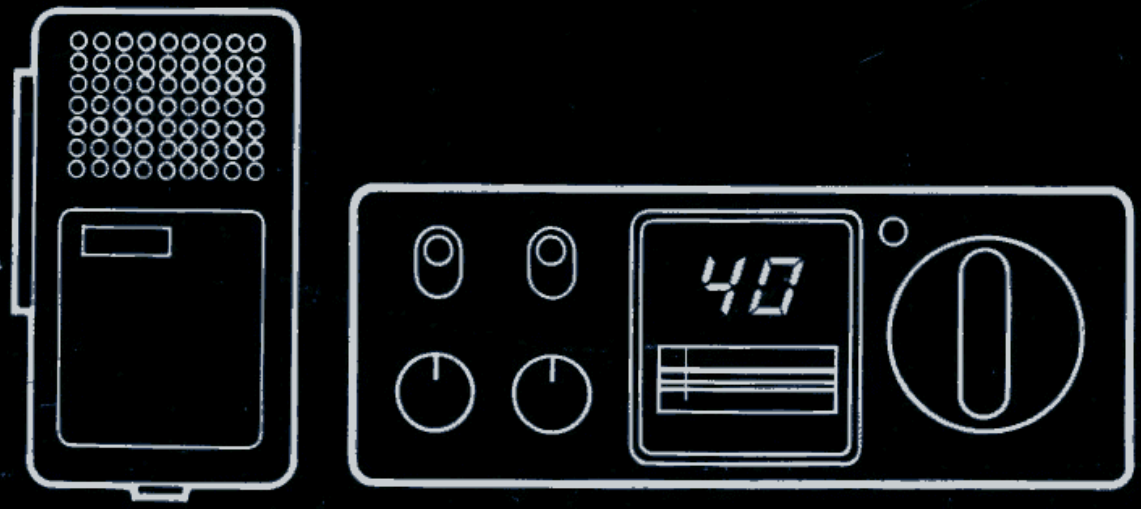
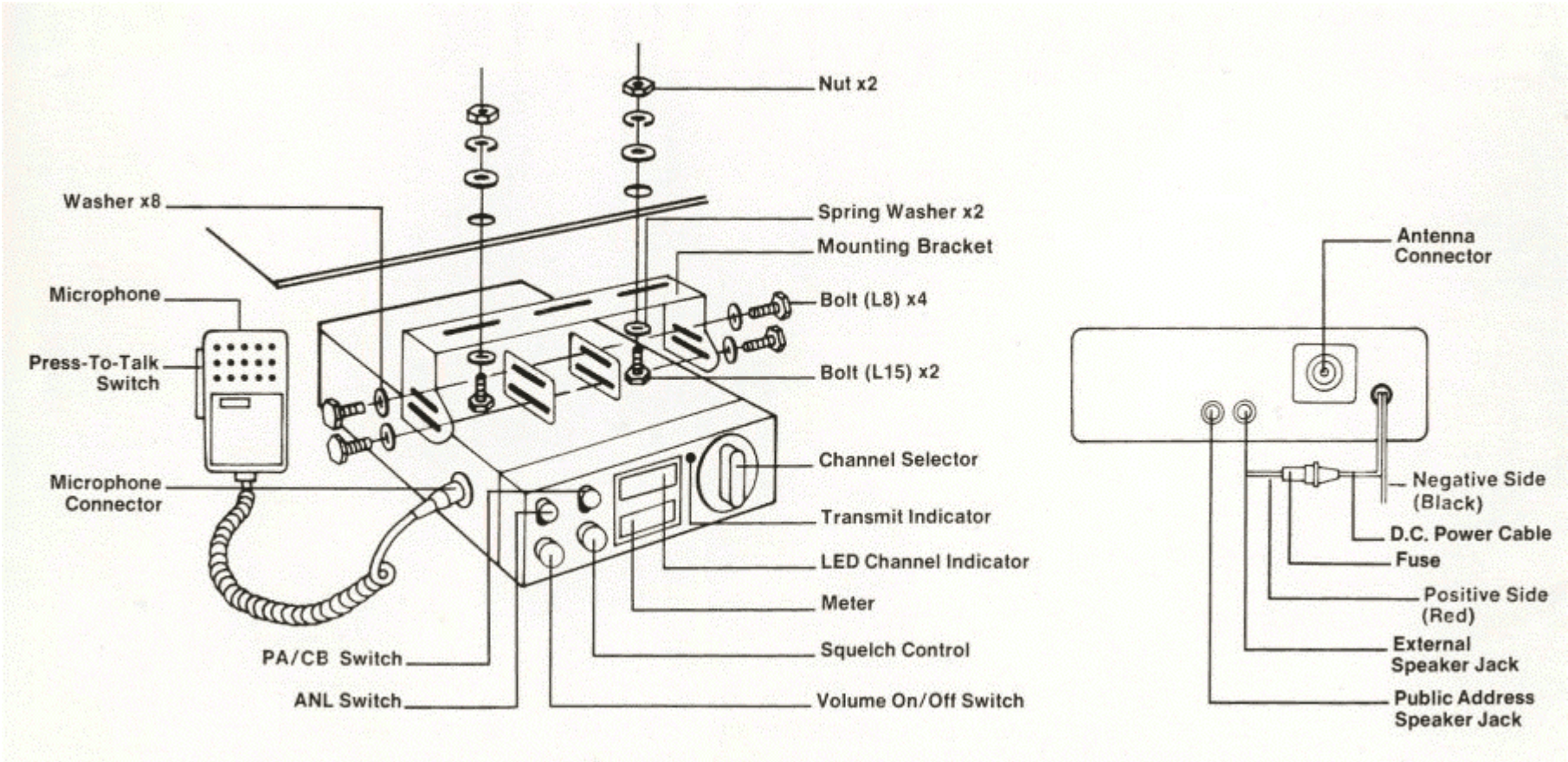
Sparkomatic CB1040 Owner's Manual

SPARKOMATIC

INSTRUCTION MANUAL CB1040

40 Channel Citizens Band Transceiver




Nut x2
Washer x8
Spring Washer x2
Mounting Bracket
Microphone
Bolt (L8) x4
Press-To-Talk Switch
Bolt (L15) x2
Channel Selector
Microphone Connector
Transmit Indicator
LED Channel Indicator
Meter
PA/CB Switch
Squelch Control
ANL Switch
Volume On/Off Switch
Antenna Connector
Negative Side (Black)
D.C. Power Cable
Fuse
Positive Side (Red)
External Speaker Jack
Public Address Speaker Jack

Message to Owners

As you are about to discover, you have just acquired a product that has been designed to give you years of trouble-free service and enjoyment.

Sparkomatic has always believed in the importance of creative design and quality engineering and strives to manufacture every product to the most exacting standards, incorporating the most advanced technology available.

Before installing and using your new Sparkomatic equipment, please be sure to read the entire manual and to follow the instructions carefully. That way you'll be sure to get the full enjoyment from all the features and capabilities engineered into your unit.

Also, please take a moment to fill out and return your warranty card, as it is for your convenience and protection.

Thank you for choosing Sparkomatic equipment.

Description

Transceiver

The CB-1040 Citizens Band Transceiver is fully solid state with 40 channel capability utilizing a Phase Locked Loop (PLL) System for Frequency Synthesis and is for Class D mobile use. The dual-conversion Super-Heterodyne Receiver has Automatic Noise Limiting (ANL) and a Variable Squelch Control providing less than one microvolt sensitivity for noise-free operation. The Audio Amplifier provides more than 3 watts of power in the receive or PA mode. The transmitter offers a full 4 watt output with up to 100 percent modulation when used on 13.8V DC nominal power source.

Controls

All necessary controls are located on the front panel. They include: ON-OFF switch-Volume Control, Variable Squelch Control, 40 Channel Selector with LED Channel Indicator, P.A. Switch and Automatic Noise Limiter (ANL). Also located on the front panel are the transmitting light (red), and illuminated S/RF Meter. On the back panel are the external speaker, the P.A. Speaker and the antenna jacks. The microphone jack is located on the left side of the unit.

Power Supply

The CB-1040 will operate on any 12V DC electrical system with either positive or negative ground.

Antenna Requirement

The results obtained with your new Sparkomatic Citizens Band Transceiver will be greatly determined by the efficiency of the antenna system used. Due to the complexity of the subject, it is not within the scope of the manual to provide detailed information on antenna systems.

The type of antenna best suited for mobile service is a Standard 52-ohm ground plane, vertically-polarized whip antenna. The vertical whip is nondirectional and can be of the loaded type (top, center or base), or a full quarter-wave. Both types use the metal body of the vehicle as a "Ground Plane."

Specifications

General

Channels	40 Channels
Frequency Range	26.965 to 27.405 MHz
Power Requirement	DC 13.8 Volt nominal
Antenna Impedance	50 Ohms
Frequency Tolerance	±0.005 percent
Frequency Control	Crystal-Controlled P.L.L. Synthesizer
Operating Temperature Range	−10C to +50C
Microphone	Dynamic 600 Ohm
Built-in Speaker	Dynamic 3-inch (80mm) 8-ohm
Dimensions	2¼" (H) x 6¼" (W) x 8 7/16" (D)
Weight	3 lbs. 10 oz.

Transmitter

Power Output	4 Watts (maximum FCC legal limit)
Modulation	Up to 100 Percent
Harmonic Spurious Emissions	−70 dB
Current Drain No Modulation	1.0 Amps
Current Drain at Maximum Modulation	1.6 Amps

Receiver

Maximum Sensitivity	0.5 uV
Sensitivity at 10 dB S/N	.7 uV (1,000 Hz 30 percent modulation)
Image Rejection Ratio	45 dB
First IF Rejection at 11.065 MHz	70 dB
Audio Fidelity (reference 1,000 cycle at 0 dB 6 dB down points)	300-2,000 Hz
Audio Output Power	More than 3 Watts at 10 percent distortion
P.A. Output Power	More than 3 Watts
Squelch (at threshold) Sensitivity	0.5 uV
Current Drain at No Signal	400 MA.
Current Drain at Maximum Output Power	900 MA.

Location

A location in the car or truck should be chosen carefully for convenience of operation and noninterference with normal driving functions. Mounting may be under the dash or instrument panel or any place a secure installation can be made.

A transceiver is usually placed under the dashboard where the ventilation is adequate. Should it be mounted elsewhere, care should be taken to avoid areas of excessive heat which may damage components.

For optimum performance of your equipment, install and handle with care. The finest equipment will not perform efficiently if installed and operated improperly.

If at any time it becomes necessary to remove the cabinet, be careful not to disturb any coil assemblies as they may affect critical calibration within the transceiver.

Mounting Bracket

The adjustable mounting bracket has predrilled holes for easy mounting under the dashboard.

Microphone

Install the microphone bracket in any easy to reach location where the cord will not interfere with operation of the vehicle.

Power Connections

Note: This transceiver may be installed and used in any 12 volt DC negative or positive ground system vehicle.

Most newer U.S. and foreign made cars and small trucks use a negative ground system while some older cars and some newer large trucks may use a positive ground system.

A negative ground system is generally identified by the — battery terminal being connected to the vehicle motor block, but if you cannot determine the polarity system of your vehicle, it is suggeted that you contact your vehicle dealer for definite information.

When connecting the power cord it may be desirable to connect one lead to the ignition switch accessory terminal so that the transceiver is automatically turned off when the ignition switch (key) is turned off. Alternately, the power lead may be connected to an available terminal on the fuse block or even to a point in the wiring harness. Care must be taken, however, to guard against a short circuit condition so when in doubt, please contact your vehicle dealer for specific information regarding your vehicle.

Negative Ground System

For a negative ground system connect the red DC power cord from the transceiver to the positive or + battery terminal or other convenient point and connect the black power lead to the chassis or vehicle frame or — battery terminal.

Mounting Instructions Continued

Positive Ground System

For a positive ground system connect the black DC power cord from the transceiver to the negative or — battery terminal or other convenient point and connect the red power lead to the chassis or vehicle frame or + battery terminal.

Ignition Interference

Engine ignition interference should not be a problem and vehicles equipped with standard broadcast radios will have enough suppression to eliminate ignition interference. If interference is present, any skilled auto radio repairman should be able to eliminate it. Take precautions when installing the antenna; make sure the coaxial cable is away from spark plugs, ignition wires, and the ignition coil.

General Operating Instructions

Carefully read all previous instructions in this Owner's Guide.

Make sure the power connection is properly made and an antenna is connected to the antenna output jack. (*Do not transmit without connecting an antenna*).

Attach the press-to-talk microphone.

Make sure the PA-CB switch is in the CB position.

To turn the set on, turn the Volume control knob clockwise until a click is heard; then continue turning the Volume control clockwise until a rushing noise is heard in the speaker.

Turn the channel selector knob to the desired channel to be used.

Note: LED Channel Indicator will display desired channel.

To adjust the squelch control: When no signals are present, adjust the squelch control clockwise until the receiver is quieted. Incoming signals will automatically release the squelch, enabling you to receive normally. Practice will determine the best setting for this control. Setting the control to the minimum position may allow weak unintelligible signals through to the speaker. Setting the control too high may not allow weaker signals to be heard.

You are now ready to receive signals or transmit to another station.

To transmit press and hold the press-to-talk switch on the microphone. Hold the microphone several inches from your mouth and speak in a normal tone of voice. It is not necessary to shout, shouting will probably only cause distortion of your transmitted signal and voice. Release the press-to-talk switch to receive.

On the air operating techniques and allowable communications are prescribed in the Federal Communications Commission rules. We strongly recommend that you read the rules so that you do not unknowingly violate operating practices.

When using the transceiver as a public address amplifier:

Connect a PA speaker to the PA jack on the rear panel.

Place the CB-PA switch in the PA position.

Turn the power on.

Depress the push-to-talk switch on the microphone and speak into the microphone. Your voice wil be heard from the PA speaker.

Volume Control and Off-On Switch

The volume control varies the sound output of the loudspeaker when receiving. It also functions as an OFF-ON switch. Clockwise rotation increases volume.

Channel Selector Switch

Tuning the receiver and transmitter is done simultaneously by rotating the 40 channel selector switch. Set the switch to the desired channel 1 to 40, the LED readout will indicate channel.

Squelch Control

The squelch control quiets the receiver when signals are not being received and allows for a noisless standby operation. It functions only in the receiver volume when signals are being received. To adjust: When no signals are present, rotate the squelch control clockwise until the receiver is quieted. Incoming signals will automatically release the squelch. Careful adjustment is necessary because settings too far to the right will not allow weaker signals to be heard.

Public Address Switch

In the PA position, your transceiver is converted to a public address system by adding an external speaker. A convenient pin jack on the back panel is provided for connection to any standard 8 ohm PA speaker.

ANL Switch

The automatic noise limiter is designed to reduce excessive noise such as ignition, motor and electrical interference. In the "ON" position, it operates to extract this noise and gives you a clear signal.

Press-To-Talk Microphone

The receiver and transmitter are controlled by the press-to-talk switch on the microphone. Press this switch in to activate the transmitter; release the switch to receive. When transmitting, hold the microphone 3 to 4 inches from your mouth and speak clearly and in a normal voice. When transmitting a red light located on front eschutcheon will go on indicating you are in the transmit mode.

Meter

This is a dual purpose meter which indicates relative output power when transmitting on lower scale and incoming signal strength when receiving on the upper scale in S units. Generally speaking, any signals you receive that are between 5-9 or over would be considered as quite strong. For transmitting, the meter indication is only relative and so the meter is not calibrated.

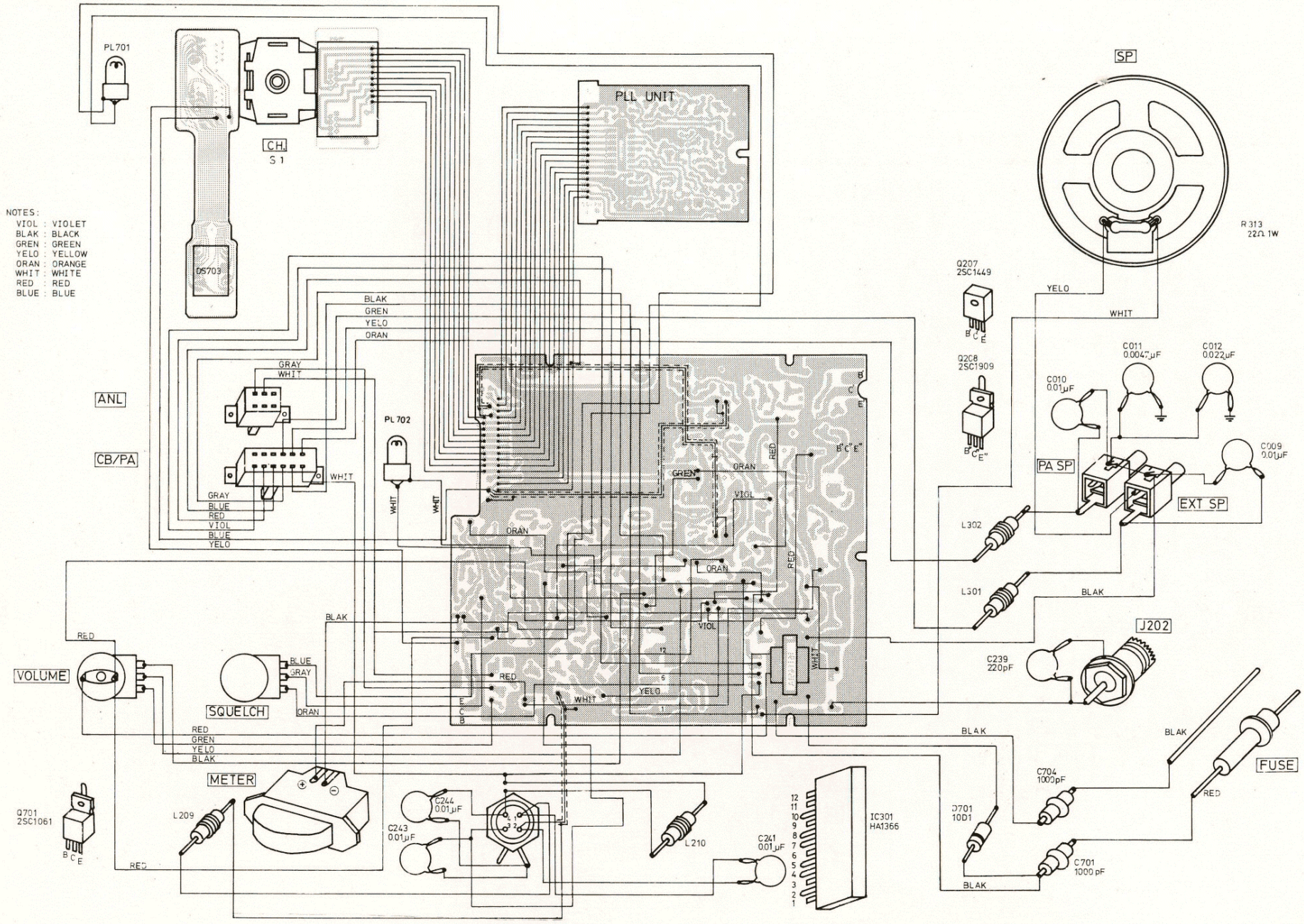
External Speaker (Ext. Sp.)

A 3.5 mm jack is provided on the rear panel for the connection of a standard 8 ohm external speaker. Occasionally, the only available location for mounting the transreceiver is such that the sound from the built in speaker is muffled by carpeting or some obstruction in the vehicle. In this case, an external speaker may be mounted to direct the sound more exactly to you. When an external speaker is connected the built in speaker is automatically disconnected.

PA Speaker

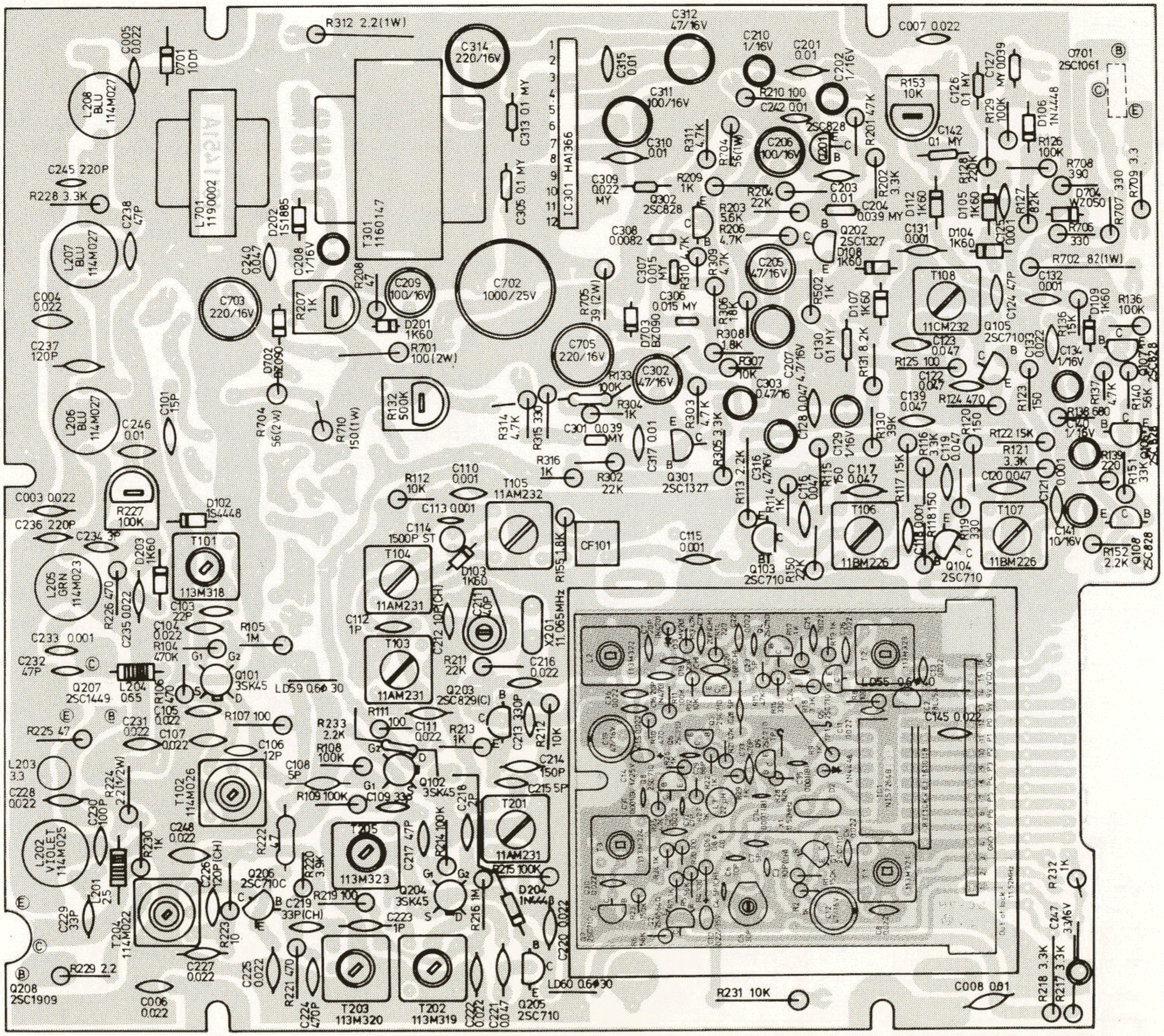
A convenient PA jack on the back panel is provided for connection to any standard 8 ohm 5 watt PA speaker. The type plug used on the speaker cord is a subminiature phone type 3.5 mm (1/8). To avoid acoustical feed-back the speaker should face away from the microphone.

Wiring Layout

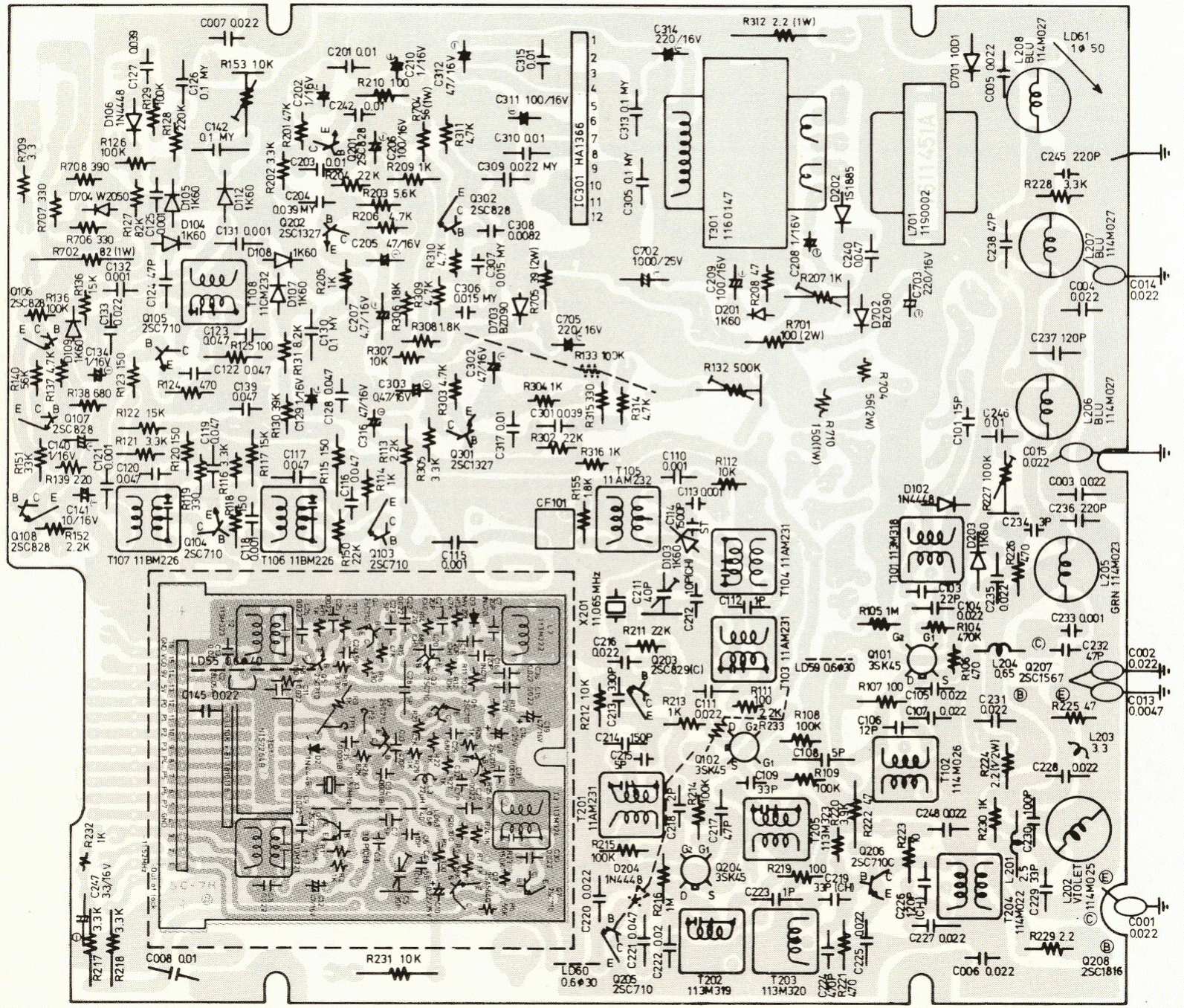


Parts Layout

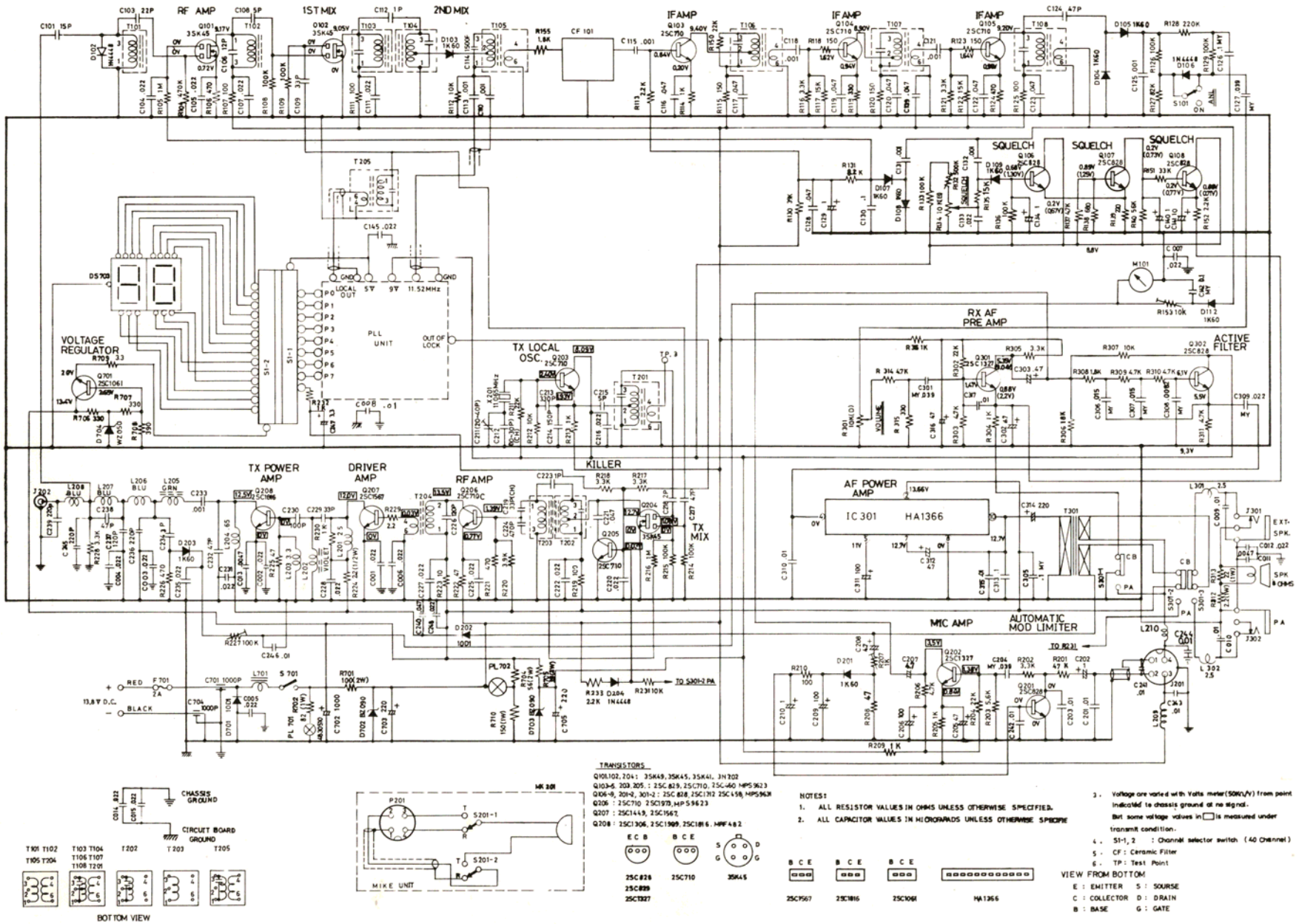
Top of P.C. Board



Bottom of P.C. Board



Transceiver Schematic Diagram



TRANSISTORS

Q101,102,204 : 3SK49, 3SK45, 3SK41, 3N202
Q103-6, 203, 205 : 2SC829, 2SC710, 2SC460 MPS9623
Q106-9, 201-2, 301-2 : 2SC828, 2SC1312 2SC458, MPS963R
Q206 : 2SC710 2SC1970, MPS9623
Q207 : 2SC1449, 2SC1567
Q208 : 2SC1306, 2SC1969, 2SC1816, MRF482

NOTES:

1. ALL RESISTOR VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED

3. Voltage are varied with Volts meter(50KΩ/V) from point indicated to chassis ground at no signal. But some voltage values in □ is measured under transmit condition.
4. S1-1, 2 : Channel selector switch (40 Channel)
5. CF : Ceramic Filter
6. TP : Test Point

VIEW FROM BOTTOM
E : EMITTER S : SOURSE
C : COLLECTOR D : DRAIN
B : BASE G : GATE

Description of Diodes, Transistors and ICs

Diodes

D102 WG713	Protector Diode
D103 1K60	2nd Mixer
D104 1K60	Detector
D105 1K60	Detector
D106 WG713	ANL
D107 1K60	AGC
D108 1K60	AGC
D109 1K60	Squech Detector
D112 1K60	S-Meter Detector
D201 1K60	AMC
D202 10D1	Protector Diode
D203 1K60	RF Power Detector
D204 WG713	Bias Regulator
D701 10D1	Protector Diode
D702 BZ090	Regulator (TX)
D703 BZ090	Regulator (RX)
D704 WZ090	LED Regulator

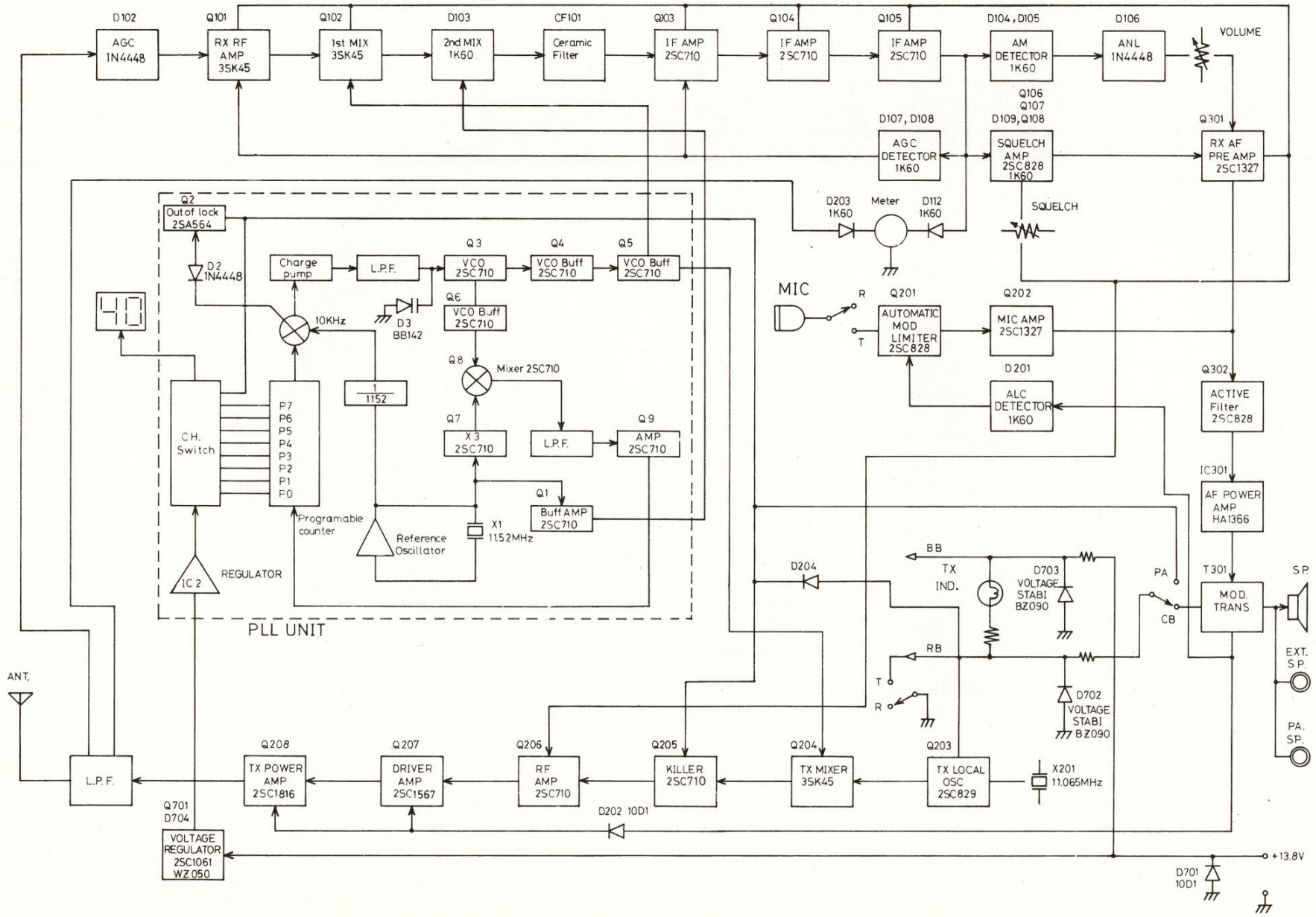
Transistor Complement

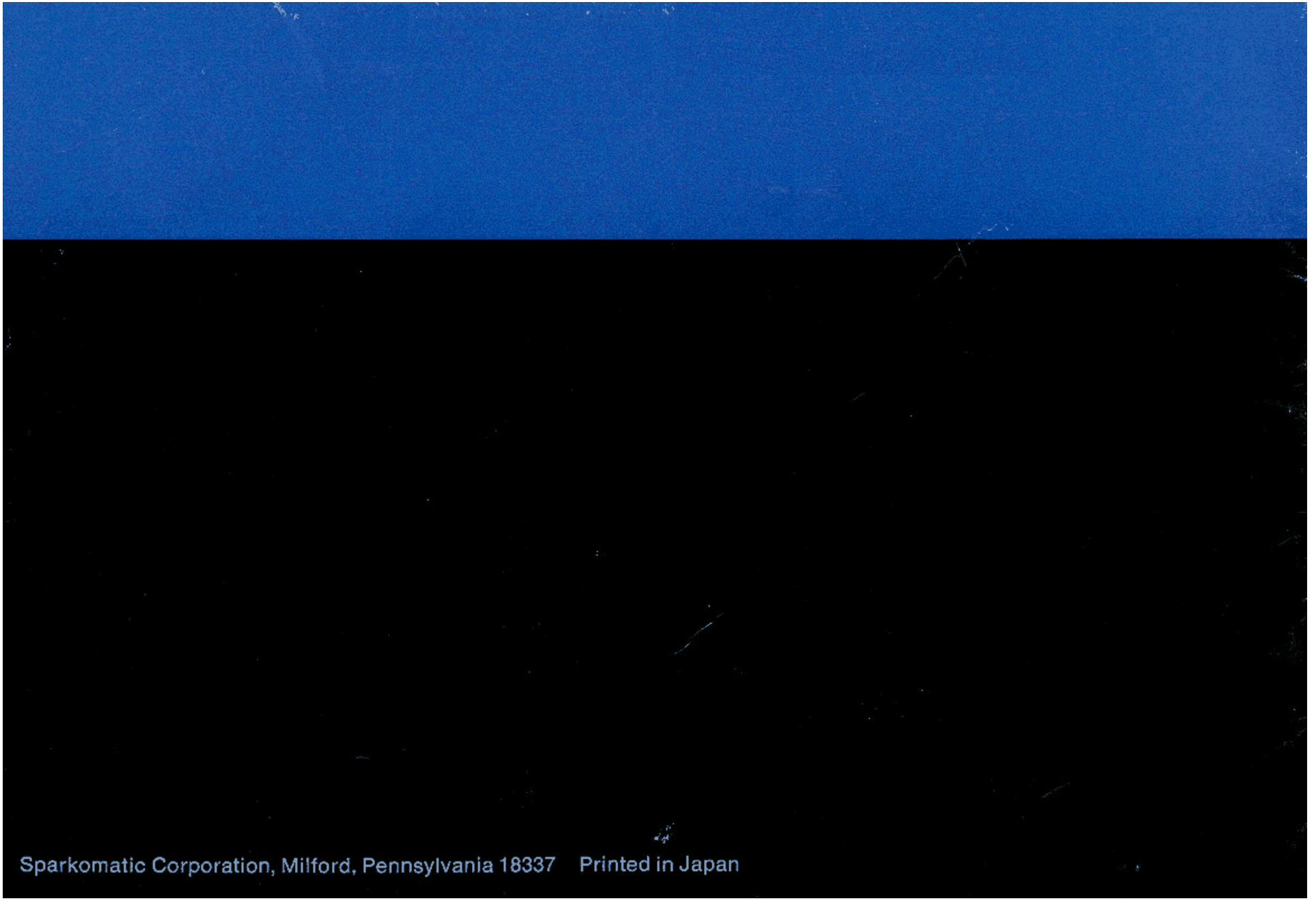
Q101 3SK49Q	RF amp (RX)
Q102 3SK49Q	1st mixer (RX)
Q103 2SC710	2nd IF amp (1st stage)
Q104 2SC710	2nd IF amp (2nd stage)
Q105 2SC1327P	2nd IF amp (3rd stage)
Q106 2SC828	Squelch amp
Q107 2SC828	Squelch amp
Q108 2SC828	Squelch amp
Q201 2SC828	AMC
Q202 2SC1327P	AF Preamp
Q203 2SC829C	Local oscillator (TX)
Q04 3SK49Q	Mixer (TX)
Q205 2SC710	RF Cancel
Q206 2SC710C	Preamp (TX)
Q207 2SC1567	Transmitter driver
Q208 2SC1816	TX Power amp
Q301 2SC1327P	Preamp
Q302 2SC828	Active Filter
Q701 2SC1061	LED Regulator

IC (Integrated Circuit)

IC301 HA1366	AF-amp/AF-Power amp

Block Diagram





Sparkomatic Corporation, Milford, Pennsylvania 18337 Printed in Japan