OSCAR

MODEL CBM271



Citizens Band Operators Manual

SMC

Citizens Band Radio Service
27MHz Frequency Modulation

Citizens Band
From November 1981 a personal two-way radio system has been available for use throughout the United Kingdom without proof of need, or technical qualification.

License
A Home Office license (available for a fee) is required. A license application form 'CB01' is available over the counter at any Post Office. This governs; the operators, conditions of use, permitted types of transmissions, and the type of antenna, please make yourself familiar with its full terms.

Channel	Frequency in MHz.
1	27.60125
2	27.61125
3	27.62125
4	27.63125
5	27.64125
6	27.65125
7	27.66125
8	27.67125
9	27.68125
10	27.69125
11	27.70125
12	27.71125
13	27.72125
14	27.73125
15	27.74125
16	27.75125
17	27.76125
18	27.77125
19	27.78125
20	27.79125
21	27.80125
22	27.81125
23	27.82125
24	27.83125
25	27.84125
26	27.85125
27	27.86125
28	27.87125
29	27.88125
30	27.89125
31	27.90125
32	27.91125
33	27.92125
34	27.93125
35	27.94125
36	27.95125
37	27.96125
38	27.97125
39	27.98125
40	27.99125

Equipment
The equipment used must conform to Home Office Performance Specifications MPT1320. The Oscar (CBM271) transceiver bears the symbol (CB 27/81) on the front panel as a mark of compliance.

Antennas
MPT1320 specifies 'A single element rod or wire antenna not exceeding 1.5m in overall length'. S.M.C. offers a range of mobile (car) and fixed (base) antennas and accessories, complying with the regulations. Data sheets DS/CB/MA and DS/CB/FA respectively are available on request.

Frequency Range
The following frequencies (shown with their channel numbers) only may be used.

The Oscar comes equipped ready to transmit and receive on all the authorized channels (without further crystals or adjustments). In the unlikely event of a failure in part of the frequency determining circuits in the transceiver, the transmitter will automatically close down, preventing potentially harmful interference to other users.

Oscar One——A General Description

The SMC Oscar (CBM271) is a full 40 channel 27 MHz, FM, CB transceiver designed to easily exceed the minimum specifications set out in MPT1320.

It is a completely solid state, compact, communications module built to withstand the shock and vibrations experienced in the mobile environment for years to come.

The frequency synthesizer incorporated provides excellent frequency stability from the hottest Summers' day to sub zero temperatures by the use of a single quartz crystal and a CMOS LSI (large scale integration) chip – the product of today's technology.

The receiver provides;
High sensitivity, (for clear reception of distant or low power stations).
High selectivity, (for minimum interference from stations on adjacent channels).
High signal handling (for continued operation in the presence of nearby stations).

The transmitter provides;
High power output, (the maximum permitted within the terms of MPT1320).
High controlled modulation (for fidelity locally and clarity at maximum range).
High spurious rejection (for the minimum of interference to other services) (Optional filter 100LP30 available – data sheet DS/CB/GR).

Standard accessories include; handbook, power lead, screw-on microphone clip (option SMC586 magnetic or SMC585 adhesive), mobile mounting bracket (option SMCATM lockable anti-theft), and a dynamic communication microphone (option SMCTHS telephone handset). S.M.C. data sheet DS/CB/GA is available on request.

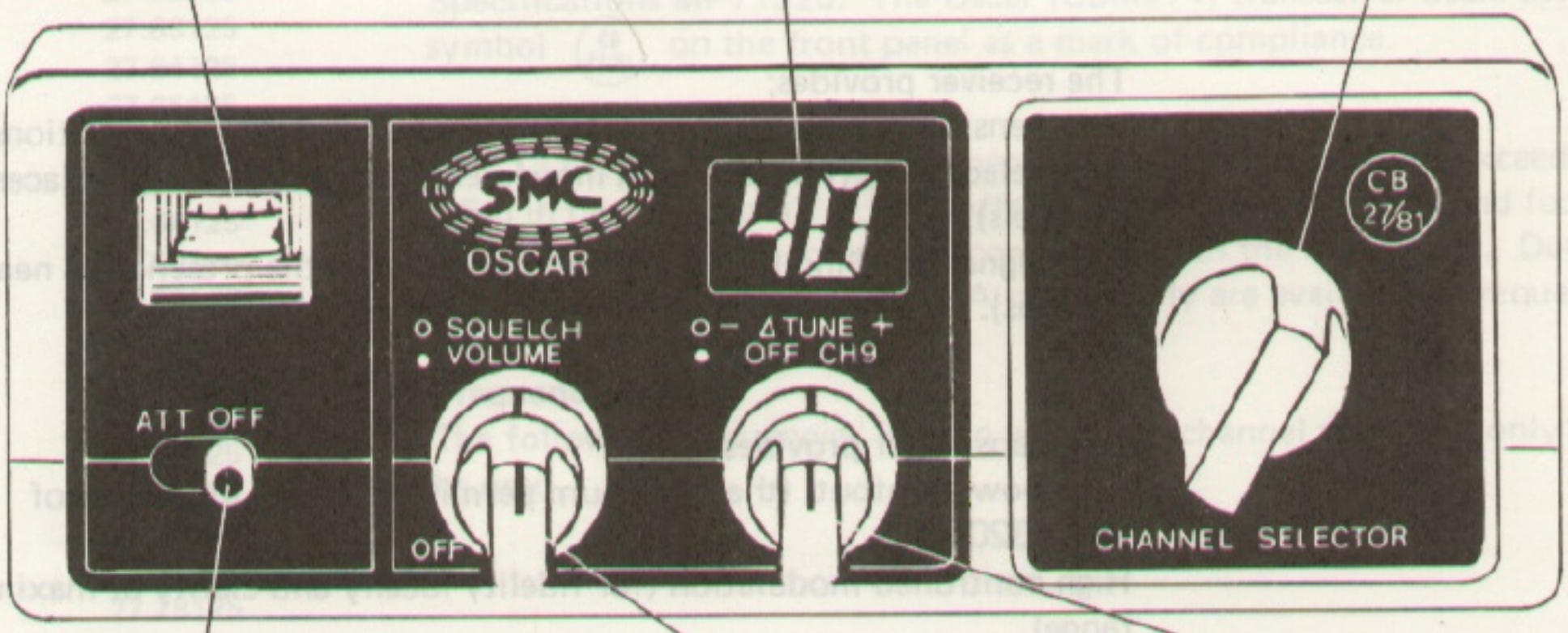
Operating Controls and Functions

The Oscar has been specifically designed for ease of operation, it does not incorporate gimmicks or redundant controls. As the operator may not be acquainted with the functions of some of the controls and improper adjustments may degrade transceiver performance, please familiarise yourself with the use of all knobs, switches and meters before operating.

Meter
This gives a visible indication of the strength of an incoming signal. On transmit the meter automatically switches to give an approximate reading of the transceiver power output (0 – 5 watts).

Display
A large red seven segment LED (light emitting diode) display of channel number – 1 to 40. A detailed table of channel number against frequency is given on page 2.

Dial
The channel change switch – each click changes frequency by 10 kHz, that is one channel. Clockwise rotation increases and anti-clockwise reduces frequency (channel number).



Attenuator
MPT1320 states "if an antenna is mounted at a height exceeding 7m (23 ft) the license will require a reduction in the transmit power by 10 dB". The Oscar is equipped with a switch to reduce the power from 4 watts (OFF) to 400 mW (ATT). As a courtesy to other users you should reduce power whenever your contact can be maintained at the lower level.

Power–Volume
The small inner knob controls the power switch and volume. Turning it clockwise (through the click) turns the power on to the set, further rotation increases the volume.

Squelch
The outer knob is the squelch control. Turning clockwise mutes (silences) the receiver in the absence of an incoming signal, further rotation requires an increased signal strength to break the mute.

Channel Nine
The small inner knob permits instant selection of channel nine irrespective of the setting of the dial when switched to its clockwise position (see general notes).

Delta Tune
The outer knob switches the receiver, above (right), on (centre), or below (left) the nominal channel by 1 kHz. This compensates for frequency errors in the received stations transmitter.

Connectors Rear and Side



Power Socket
The Oscar requires a nominal 12 volt DC supply for operation. The power plug supplied is a push-in non-reversable 3 pin connector c/w 175 cms of cable and a 2 Amp, 20 mm in-line fuse assembly. *Incorrect polarity connection or replacing the fuse with one of incorrect rating can seriously damage the transceiver.*

Speaker Socket
To improve reception quality, provision is made for an external speaker (SMC part numbers SMCES8/8 or FSP1). This should be rated at 8 ohms impedance and at least 4 watts power handling. Connection is made via a 3.5 mm, 2 conductor (mono) jack plug (SMC part number SMCP8) the insertion of which disconnects the internal speaker.

Antenna Socket
The antenna connection is made via a UHF (SO239N) coaxial socket. The mating UHF plug is of the PL259 variety (exact part number depends on cable size etc.). *Transmission without a good 50 ohm, low VSWR, antenna or dummy load can cause serious damage to the transceiver.*

Serial Number
The back panel and the carton contains the serial number of the transceiver. It is strongly recommended you record the same in the space below and also store the same with your personal records.

OSCAR purchased / /
Serial Number:

Microphone Connector
The microphone socket and plug retaining support is located on the left hand side panel. Insertion of the microphone (a push fit 5 pin 180 degree DIN plug SMC part number 478-267) completes several electrical circuits. It is essential the microphone is plugged firmly in at all times. The Oscar will not transmit or receive without.

Antenna Considerations——Mobile

For the best reception and transmission the antenna selected must be purpose designed for a centre frequency of 27.8 MHz. The licence restricts the maximum whip length to 1.5 metres, shorter antennas (with possibly slimmer base loading coils) are available. Generally the longer antennas will work more effectively than shorter ones but asthetics and safety are important considerations.

A full range of high efficiency 'Oscar Mobile Antennas' complying with MPT1320 are available from your dealer.

A few general rules should be noted:

1 Mount the antenna as high as possible.
2 The higher the percentage of the antennas length above the rooftop the better the performance to be expected.
3 Maximise the available 'ground plane' by positioning the antenna in the centre of roof, gutter, boot etc.
4 Install the antenna cable run as far from noise sources (ignition, altenator, petrol pump etc.) as possible.
5 A good metal to metal earth connection can be important.
6 Do not kink or compress or let 'flap' the coaxial cable.

Antenna Location——Mobile

The exact location on a vehicle of an antenna will modify its ability to transmit and receive equally in all directions – the radiation pattern is changed.

Roof Mount
The antenna mounted in the centre of the roof represents the closest to ideal situation. For safety reasons it may be desirable to use a shorter type whip particularly if a magnetic base is used in preference to a hole mount.

Gutter Clip Mount
The radiation pattern is broadly maximum opposite the side that the antenna is mounted. It is a simple semi-permanant installation offering good performance. Cable entry into the vehicle, as with roof top magnetic mount may be problematic, but self adhesive cable grips (SMC part number YCGA) are available to stop cable 'flapping' against the roof at speed.

Boot Lip Mount
The radiation pattern is maximum in the direction of the front bumper, but if mounted centrally on the forward edge of the boot it will otherwise be symetrical. A simple semi-permanant installation with reasonable performance.

Front Wing Mount
The radiation pattern is slightly greater in the direction of the rear bumper opposite the side on which the antenna is mounted. This provides ease of installation (cable route can often follow intended path of broadcast aerial cable) but electrical interference from the engine may be near maximum.

Rear Wing Mount
The radiation pattern is strongest in the direction of the front bumper opposite the side on which the antenna is mounted. In certain cars installation is eased through the provision of cable trunks for radio telephones, and rear lights etc. Electrical interference from the engine may be lower but electric petrol pumps particularly the high pressure recirculating types may prove problematic.

The five installations detailed above require different base fittings a full range of SMC – Oscar Accessories are available from your dealer.

Antenna Considerations——Base Station

The Oscar is designed to operate into an impedence of 50 ohms. Thus antennas, dummy loads, switches, filters, SWR meters, tuners and coaxial cables (both long runs and jumper leads) should be of nominal 50 ohms impedance. *Failure to adopt this standard will reduce the efficiency of the installation and may cause permanent damage to the transceiver.*

MPT1320 requires a reduction of 10 dB in transmitter output (to maximum power of 400 mW) if the antenna is sited over 7 metres (23 feet) above the ground. The Oscar is equipped with a front panel switch which should be used when a high antenna is employed. The specifications also call for a single rod or whip radiating element not exceeding 1.5 metres in length. A range of 'Oscar Base Antennas' are available to specifications.

Experience indicates for maximum reliable coverage on 27 MHz an antenna should be erected in the clear and as high as possible.

However the feeder loss (power wasted in the coaxial cable joining transceiver to antenna) should be considered. At 27 MHz small 5.5 mm cables (e.g. UR 43, UR 76 or RG 58) has a loss of between 2.2 and 3 dB (about 45%) for a hundred feet and for large 11.2 mm cables (e.g. UR 67, RG 213 or RG 8) the loss is between 1.0 and 1.1 dB (about 20%) for a hundred feet.

It is strongly recommended that only coaxial cable with a high percentage braid covering be used. Low covering increases losses, increases interference received on the transceiver and increases the likelyhood of causing interference to Hi Fi and television receivers. Judicious routing of cables from the antenna to the transceiver is suggested avoiding all obvious "at risk items" particularly television pre amplifiers and distribution amplifiers especially those used communally.

With constraints of licence conditions, feeder loss, asthetics, practicality and planning permission the exact configuration of any installation must be on individual basis.

Antenna Matching

Obtaining a good match between the transceiver and antenna is important for optimum performance. When the antenna is matched perfectly it accepts all the available power generated by the transmitter.
As the parameter most easily measured, that indicates the quality of match, the voltage standing wave ratio (often abbreviated to SWR) is a convenient method of judging one of the qualities of an antenna.

SWR	Accepted Power	SWR	Accepted Power
1 : 1	100 %	3 : 1	75.0 %
1.3 : 1	98.3 %	4 : 1	64.0 %
1.5 : 1	96.0 %	5 : 1	58.0 %
1.7 : 1	93.3 %	6 : 1	47.0 %
2 : 1	89.0 %	10 : 1	33.0 %

The SWR of the antenna may be measured using a SWR bridge – SMC part number T3-170L (Twin meter) or S3-30L (Single meter).
N.B. The power not accepted by the antenna is reflected (returned) to the transmitter, consequently *high SWR values (3:1 or more) may cause serious damage to the transceiver.*
Most available antennas are factory tuned but the exact resonance point depends upon the positioning (closeness of nearby objects) and the mounting arrangements (distance to the effective ground). It is therefore highly desirable to optimise an antenna in site for minimum SWR reading using a SWR meter (previously itemised).
Although the standing waves existing on the coaxial cable can only be removed by adjustment at the antenna, the transmitter can be made to 'see' an optimum load by the use of an antenna tuning unit (SMC part number 100TU27).

Power Connection——In Car

The SMC Oscar operates from a nominal 12 volt supply.
Connection directly across the 24 volt system of a boat or lorry will seriously damage the transceiver.
The "radio earth" (printed circuit board) is not directly connected to the chassis of the transceiver thus the Oscar may be operated in negative or positive earth cars without adjustment. *However the Red lead must be connected to the positive supply and the Black to negative, incorrect connection could seriously damage the transceiver.*
N.B. As most modern cars have a negative earth system, the power lead comes equipped with terminals to suit. If your vehicle has a positive earth (check by looking at the battery — the uninsulated cable running directly to the chassis is the earth connection) you must reverse the terminals.
It is recommended that the battery be disconnected during final wiring and installation of the transceiver, (to prevent accidental short circuits) and that a 12 volt bulb with flying leads is a useful tool for locating a suitable earth and 'hot' point in the electrical system.
The lead with the solder tag should be connected to the metal bulkhead or any other small screw that is connected to the vehicle chassis. For a more secure connection a solder joint may be made.
The lead with the 'piggy back' (male/female) push on connector should be connected to the 'hot' point of the system. Suitable places are the ignition switch, the voltage regulator side of the ammeter, or the fuse block. If connection is made to the accessory terminal of the fuse block or ignition switch the transceiver will automatically be switched off with the vehicle ignition, therefore preventing accidental battery drainage.
It is recommended that due regard be given to insulating the 'piggy back' connector with PVC tape and that any excess power lead be coiled up and secured so that it cannot interfere with the drivers controls.
For temporary connection a power takeoff can be provided from the vehicles cigar lighter socket. An adaptor (SMC part number SMC 251) is available for this purpose.
For fibreglass vehicles and boats in general, connection should be made direct to the battery. In certain circumstances this may reduce some electrical noises produced in conventional vehicles, but great care should be exercised that the 'hot' lead does not short through any bulkheads when routing the cable into the passenger compartment.

Power Connection——Base Station

The Oscar can be used as a base station with a suitable low voltage supply. If the supplied power cable has been permanently installed in a vehicle additional power cables (SMC part number PCOSC) are available from your dealer.

A car battery can be utilized, but it is strongly recommended that a permanent connection be made to the terminals to avoid the possibilty of reversed polarity which will be magnified by the frequency of such connections. If a trickle charger is to be used the transceiver should be completely disconnected, at the power plug before charging commences.

A regulated power supply providing around 13.2 volts at least 3 amps from the domestic mains supply is recommended. SMC power supply RU-12-04-06 is designed for this purpose.

Transceiver Installation——In Vehicle

Fig. 1 Dash Mounted

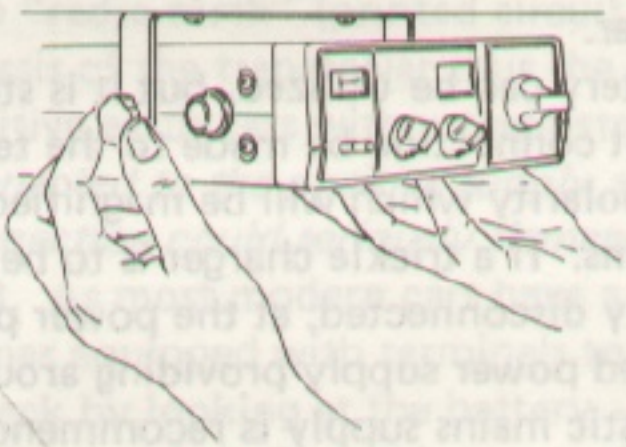
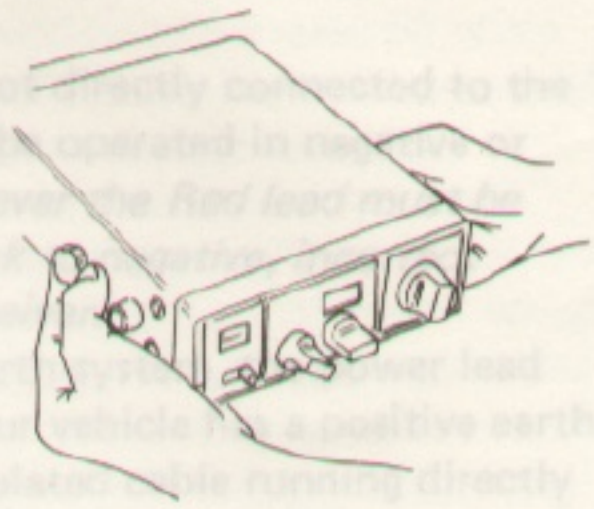
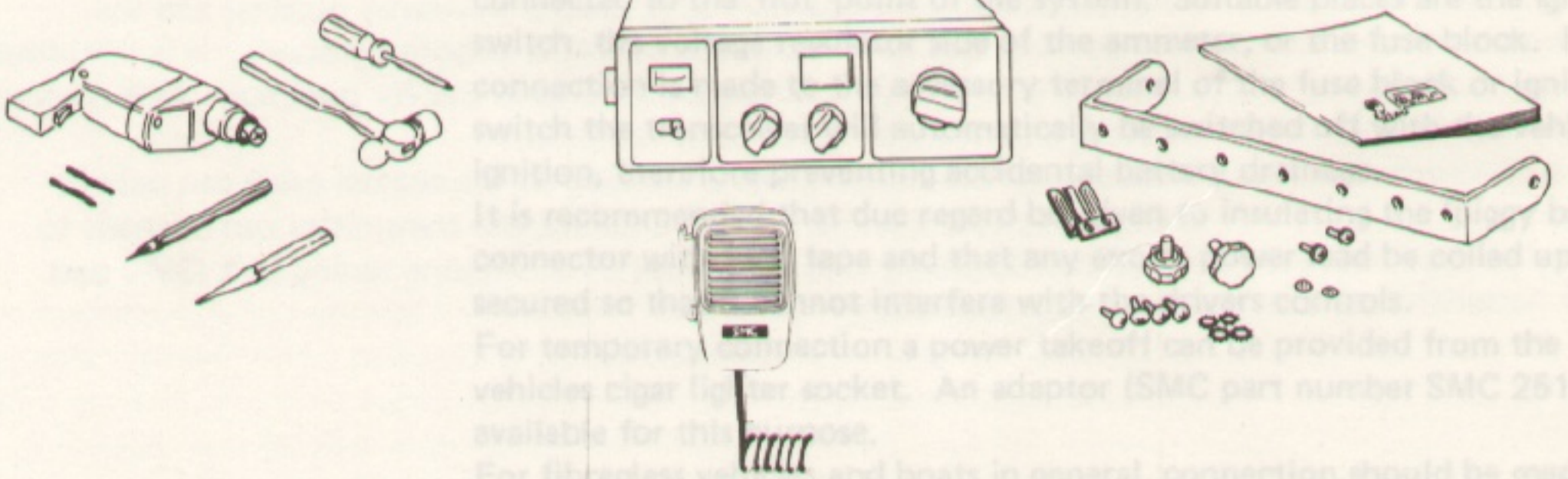


Fig. 2 Floor Mounted



Choose a convenient location from the operational standpoint, **check** that this is not directly under the heater output, it does not interfere with the driving position, and that the fixing screws will not damage any cables or pipes.

Check that it is convenient to run the antenna cable and power lead to the chosen location.



Collect together the necessary tools: — pencil, drill, 5/32" drill bit, 1/8" drill bit, tape measure, Phillips screwdriver, centre punch, hammer, and perhaps a knife, soldering iron and resin core solder.

Unpack the entire contents of your Oscar gift box.

Route the antenna and power leads to the correct position.

The mounting bracket may be used as a gimble-type overhead dash mount, (Fig. 1 and Fig. A, B, C, D), or as a base-type floor mount, (Fig. 2 and Fig. E, F, G, H).

The bracket should be used as a template to mark where the holes will be drilled. Take care the drill does not run in too far, damaging pipes or cables. Measure with care and re-check to insure the installation will be straight. With the centre punch, indent the marked areas. Use at least 3 screws for a sturdy installation. Be sure to cut the carpet before drilling.

Dash Mounted

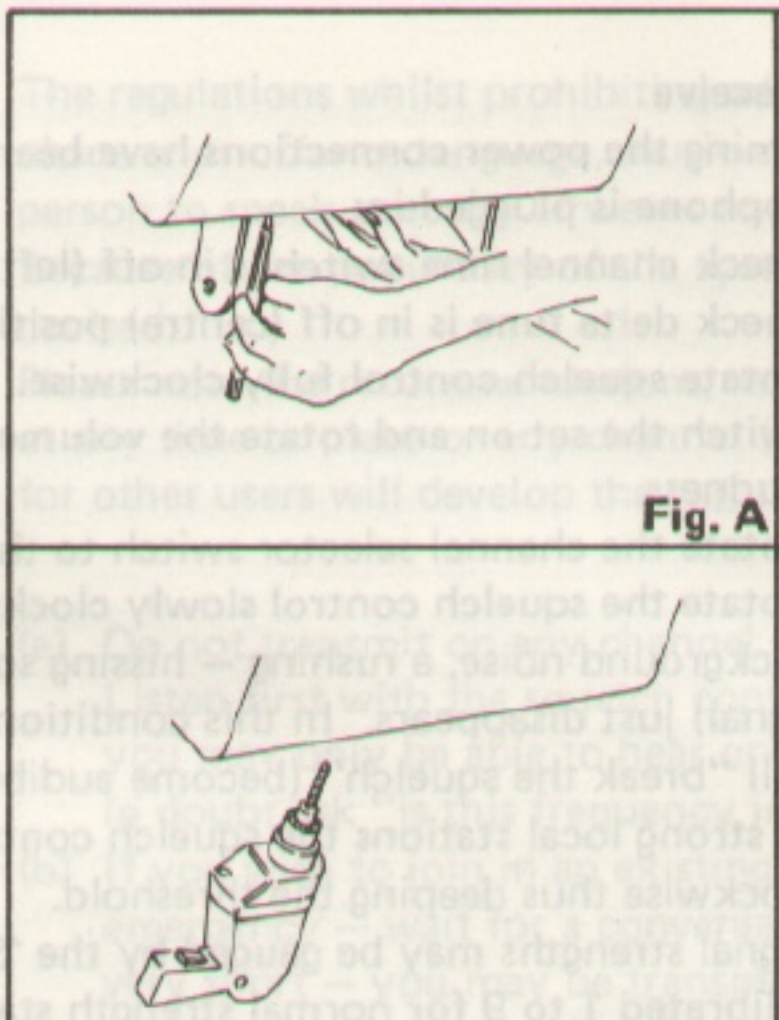


Fig. A

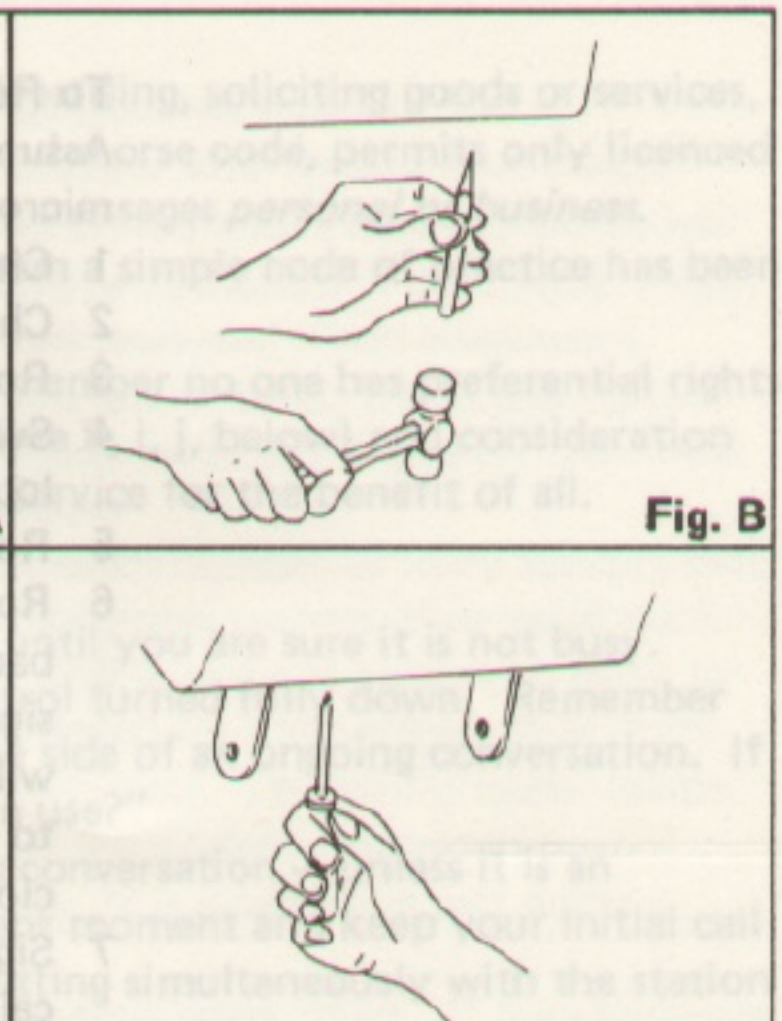


Fig. B

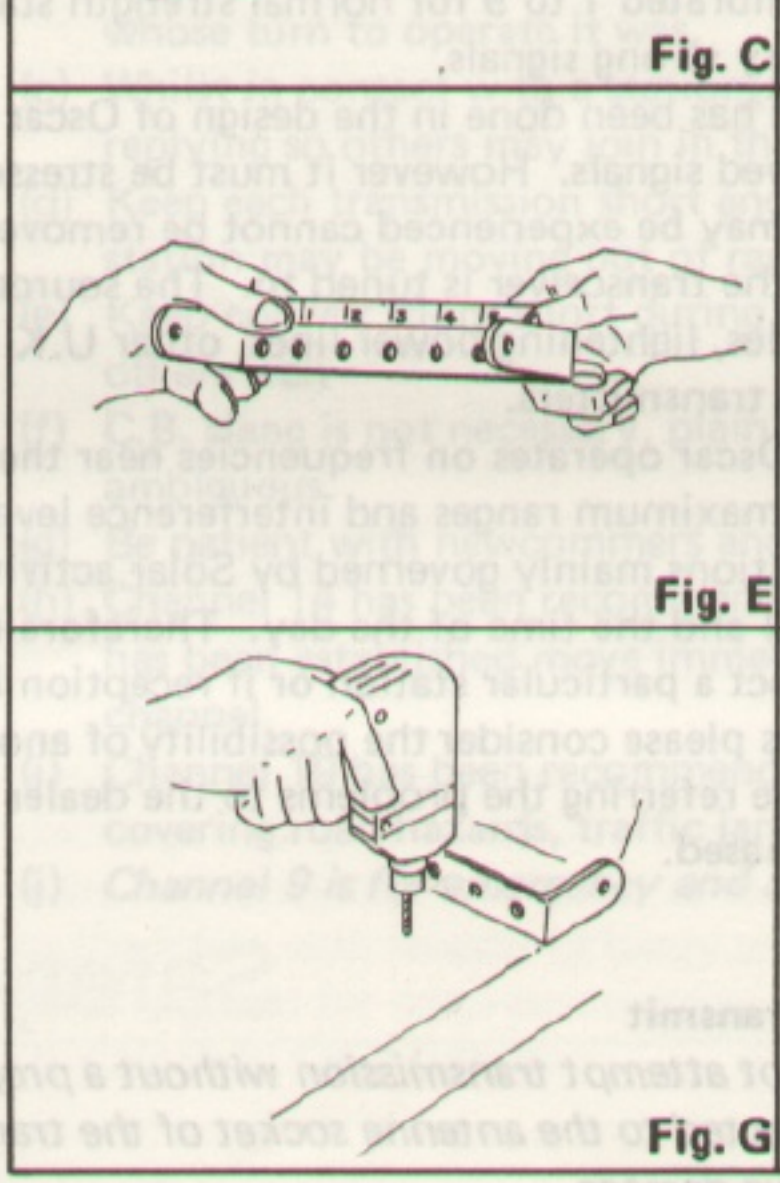


Fig. C

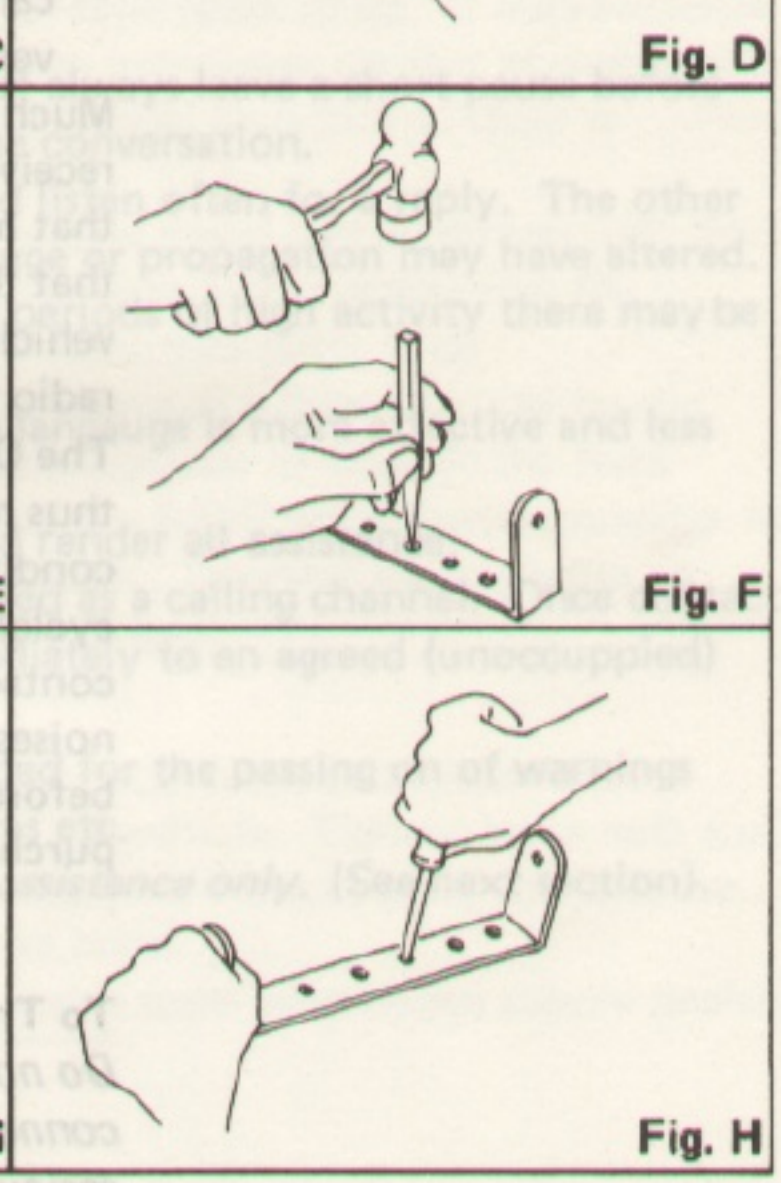


Fig. D

Floor Mounted

Fig. E

Fig. F

Fig. G

Fig. H

The microphone hanger bracket should be installed within easy reach, but in a position that does not strain the cable in use, and most importantly does not interfere when hanging, with any of the controls, foot or hand, of the vehicle.

As a deterent to theft from vehicles of the Oscar a theft guard unit YFHRI is available. When a line from the transceiver to the unit is cut, the horn will be switched on and off at an adjustable rate (2-25 seconds) probably discouraging further tampering.

Operating Instructions (and Notes)

To Receive

Assuming the power connections have been correctly made and the microphone is plugged in: –

1 Check channel nine switch is in off (left) position.
2 Check delta tune is in off (centre) position.
3 Rotate squelch control fully clockwise.
4 Switch the set on and rotate the volume control to the desired loudness.
5 Rotate the channel selector switch to the desired channel.
6 Rotate the squelch control slowly clockwise to the point where the background noise, a rushing – hissing sound (without an incoming signal) just disappears. In this condition the very weakest of stations will "break the squelch" (become audible). If you desire to listen only to strong local stations the squelch control can be rotated further clockwise thus deeping the threshold.
7 Signal strengths may be gauged by the 'S' meter reading. This is calibrated 1 to 9 for normal strength stations and then 9 + 30 dB for very strong signals.

Much has been done in the design of Oscar to eliminate interference on received signals. However it must be stressed that most of the interference that may be experienced cannot be removed as it actually on the channel that the transceiver is tuned to. The sources of interference are many, vehicles, lightening power lines, other U.K. C.B. users, and a multitude of radio transmitters.

The Oscar operates on frequencies near the top of the short wave band and thus maximum ranges and interference levels depend on propagation conditions mainly governed by Solar activity (Sunspots and rotational cycle) and the time of the day. Therefore if it is not possible to regularly contact a particular station or if reception is made difficult by strange noises please consider the possibility of anomalous propagations conditions before referring the problems to the dealer from whom the stet was purchased.

To Transmit

Do not attempt transmission without a proper antenna or load being connected to the antenna socket of the transceiver. This could cause serious damage.

Transmit-receive switching is effected simply by pressing the push to talk (PTT) bar on the microphone for as long as you wish to transmit. Hold microphone about 4 inches from your mouth and speak in your normal voice at normal conversational level.

Operating Practice

The regulations whilst prohibiting advertising, soliciting goods or services, obscene or offence language, music and morse code, permits only licenced person to speak over the airwaves any messages *personal or business.*
Because of the popularity of the system a simple code of practice has been devised.
Please note the recommendations, remember no one has preferential rights at any time or place or any channel (see h, i, j, below) and consideration for other users will develop the C.B. Service for the benefit of all.

(a) Do not transmit on any channel until you are sure it is not busy. Listen first with the squelch control turned fully down. Remember you may only be able to hear one side of an ongoing conversation. If in doubt ask "is this frequency in use?"
(b) If you wish to join in an existing conversation – unless it is an emergency – wait for a convenient moment and keep your initial call very short – you may be transmitting simultaneously with the station whose turn to operate it was.
(c) Whilst in contact with a station(s) always leave a short pause before replying so others may join in the conversation.
(d) Keep each transmission short and listen often for a reply. The other station may be moving out of range or propagation may have altered.
(e) Keep conversations short during periods of high activity there may be others wait
(f) C.B. slang is not necessary, plain langauge is more effective and less ambiguous.
(g) Be patient with newcommers and render all assistance.
(h) Channel 14 has been recommended as a calling channel. Once contact has been established move immediately to an agreed (unoccuppied) channel.
(i) Channel 19 has been recommended for the passing on of warnings covering road hazards, traffic jams etc.
(j) *Channel 9 is for emergency and assistance only.* (See next section).

Emergencies and Assistance

At all times and on all channels give priority to calls for help.
Leave Channel 9 clear for emergencies. When contact has been established (with say one of the volunteer monitoring services), change channel as soon as practical.
If you hear an emergency call, wait, if no regular volunteer monitor answers, then offer help if possible.
It is important to note that because of the popularity of the service it is probable there may be someone within range able to assist in an emergency, but there is no official organisation for monitoring and there is no gurantee that you will be in reach of a volunteer monitor.
C.B. is not a substitute for the 999 Telephone services, nor the Marine distress frequencies.

Safety

Do Not Transmit

(a) When fuel or any other explosive substance are in the open e.g. — filling stations, when petrol or gas tankers are loading or unloading, or near oil rigs or quarries.
(b) If you are driving a vehicle in adverse conditions and holding a microphone or carrying out a conversation, may interfere with your ability to drive safely.
(c) With the antenna less than 15 cms (6") from your face.

Vehicle Suppression

Although F.M. radio with limiting circuits shows considerable improvement in rejecting ignition and similar interference over simple AM receivers some noise is still to be expected and is normal. There will be a higher level of noise present when the transceiver is used mobile and the engine is running. Most of this can be reduced if not eliminated.

It is essential that the vehicle is in good state of tune. Clean and tighten all connections, including alternator/dynamo battery regulator, electrical gauges, electrical fuel pump etc. etc.

In order to find and eliminate the maximum number of noise sources that are present in any vehicle, start with the strong sources, then work back. To ensure the noise comes from your vehicle and not outside it, drive to a location that is free of man-made electrical interference (such as noisy power lines, industrial noise, or other vehicles). To test for noise, locate a weak signal with the engine off. Start the engine, ignition noise will probably be present at all engine speeds. If it is severe, it will make a normally readable signal unreadable.

To reduce ignition noise, install resistor-type spark plugs. If nonresistance ignition wiring is used, install a 10 k-ohm suppressor resistor at each spark plug tower of the distributor. Install a coaxial capacitor as close as possible to the ignition coil primary.

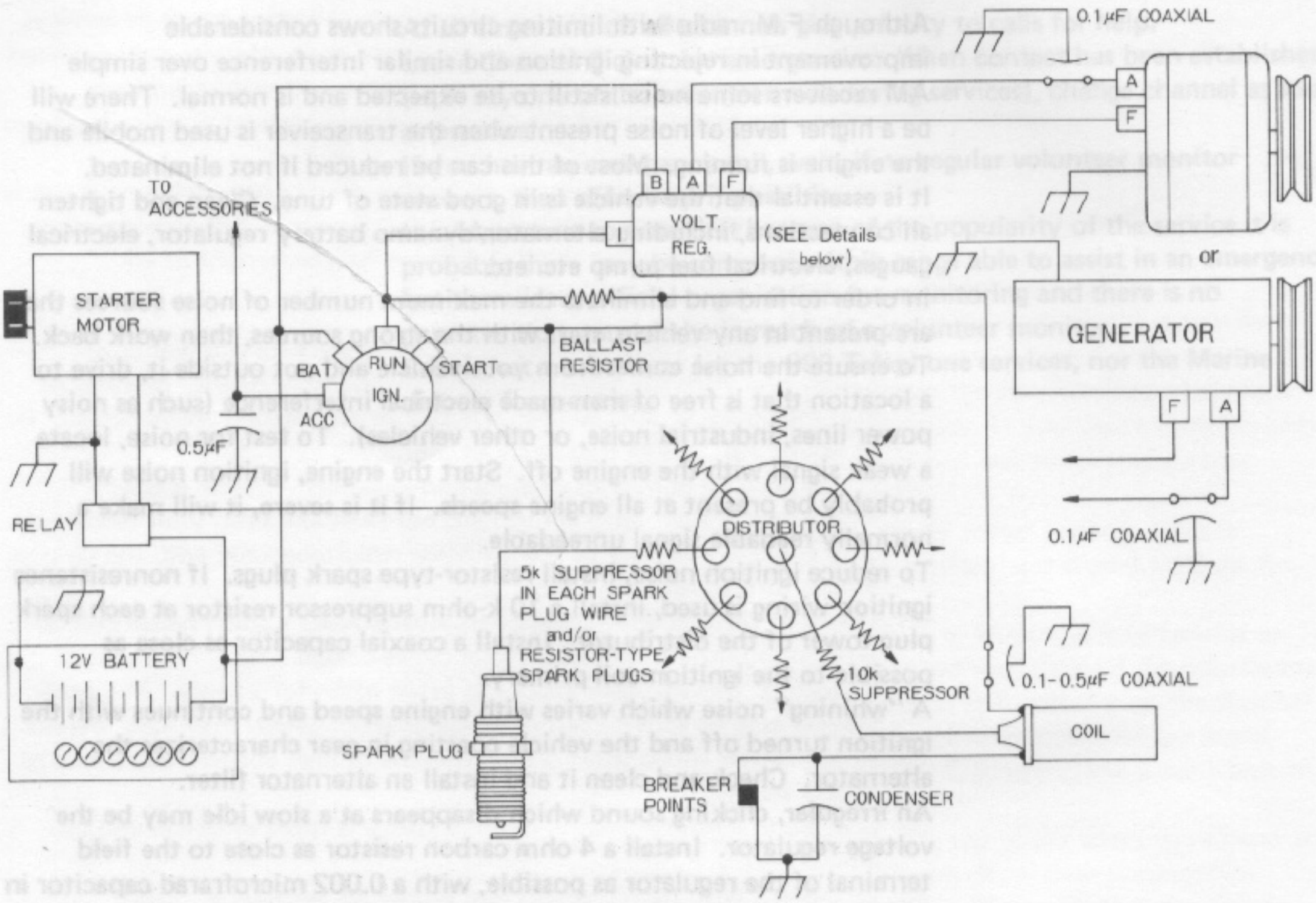
A "whining" noise which varies with engine speed and continues with the ignition turned off and the vehicle coasting in gear characterizes the alternator. Check and clean it and install an alternator filter.

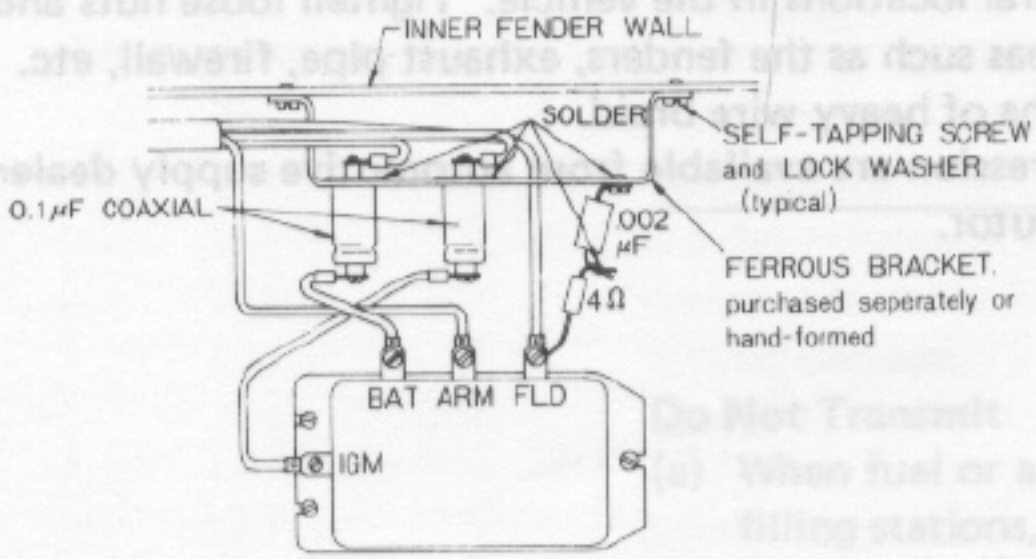
An irregular, clicking sound which disappears at a slow idle may be the voltage regulator. Install a 4 ohm carbon resistor as close to the field terminal of the regulator as possible, with a 0.002 microfrarad capacitor in series and as close to the resistor as possible. Connect the capacitor to ground. See the detail drawings on next page.

Irregular popping noises which vary with road surfaces indicate static discharge at any of several locations in the vehicle. Tighten loose nuts and bolts and bond large areas such as the fenders, exhaust pipe, firewall, etc. to the frame with lengths of heavy wire braid.

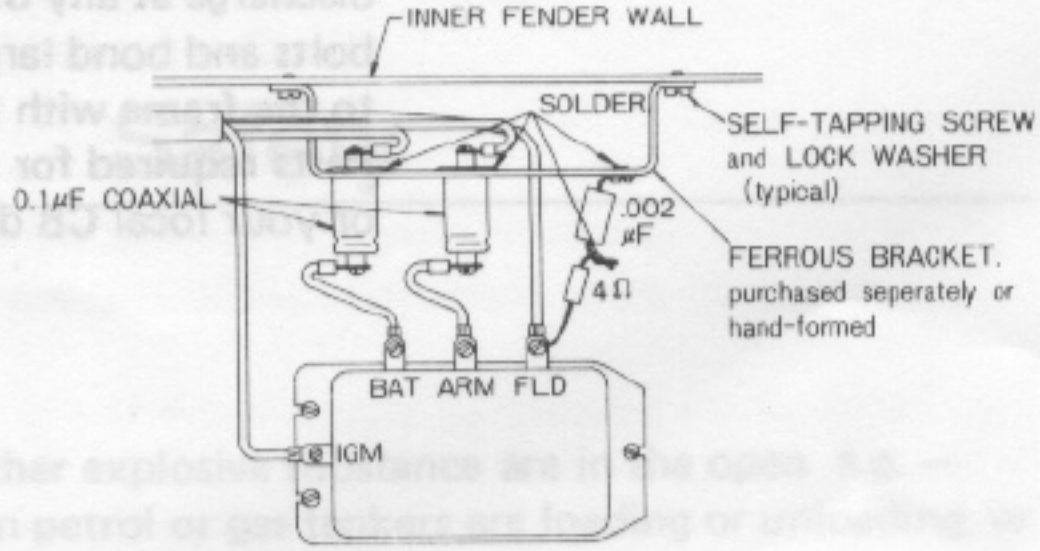
Parts required for suppression are available from automotive supply dealers or your local CB distributor.

Noise Suppression





— FOR CARS EQUIPPED WITH —
ALTERNATOR



— FOR CARS EQUIPPED WITH —
GENERATOR

Service and Maintenance

The SMC Oscar has been designed and constructed to exacting standards. It should provide years of trouble free enjoyment, convenience and practicality, provided it is treated with the care normally accorded to any complex electronic equipment, and the warnings and ratings contained in this manual are observed.

If you encounter any difficulty in operating the transceiver please check the following fault finding list – if the trouble persists contact the dealer from whom you purchased the Transceiver.

Symptom	**Possible cause** (and Remedy)
Unit dead (no meter illumination or channel readout) on switch on.	(1) Blown Fuse replace with one of correct rating. (2) Power Wires have become disconnected (review installation instructions).
Unit will not send or receive but meter and channel readout illuminated.	(1) Antenna disconnected or damaged. (2) Microphone not plugged in.
Unit will not change channel.	(1) Channel Nine revert switch on.
Unit will not receive.	(1) External speaker plug not fully in.
Unit receives weaker stations with unusual distortion.	(2) Delta Tune not switched off.
Unit receives only very strong stations.	(1) Squelch set to high (readjust).
Unit receives but will not transmit properly	(1) Loose microphone connection. (2) Antenna problem. (3) Defective microphone or lead. (Substitute another microphone)

Specifications

Designed in compliance with MPT1320

General

Frequency Range		27.60125 – 27.99125 MHz
Channel Spacing		10 kHz
Channels		40
Generation Method		C MOS LSI, PLL Frequency synthiser
Mode		Angle (Frequency Modulation)
*Temperature Range		–5°C to +45°C
Antennia Impedance		50 ohms nominal
Power Source		12 volts DC (13.2 volts, nominal)
Voltage Range		10.8 volts to 15.6 volts
Chassis Polarity		Floating earth
Current Consumption		Receive 200 mA – Squelched (typical)
		Receive 500 mA – Full Volume (typical)
		Transmit 1.5 A at 4 watts (typical)
		Transmit 0.5 A at 400 mW (typical)
Dimensions	Width	160 mm (6-3/8") – 170 mm (6-11/16") with projections
	Height	57 mm (2¼") – 60 mm (2-3/8") with projections
	Depth	205 mm (8-1/16") – 236 mm (9-5/16") with projections
	Weight	1.46 kg (3.2 lbs.) nett.
Dimension (Packed)		2.02 kg (4.5 lbs.) gross with accessories
Controls/Indicators		On/Off–Volume
		Squelch
		Channel nine revert
		Delta Tune (– 1 kHz, 0, + 1 kHz), RIT.
		Attenuator (4 Watts/400 mW)
		Channel Selector Switch
		LED Readout Channel Indicator
		'S' meter/P.O. meter – illuminated
Jack/Connectors		Antenna (S0239)
		Microphone (5 pin Din, 180°)
		External Speaker (3.5 mm mono)

Transmitter

*R.F. Output Power	4 Watts nominal
	400 mW (Attn position).
*Frequency Tolerance	< ±1.5 kHz
*Frequency Responce	500 Hz to 2,500 Hz (+4, –12 dB).
*Frequency Deviation	±1.5 kHz (at 1,250 Hz modulation)
*Adjacent Power	< 10 μW (at +20 dB over 60% mod.)

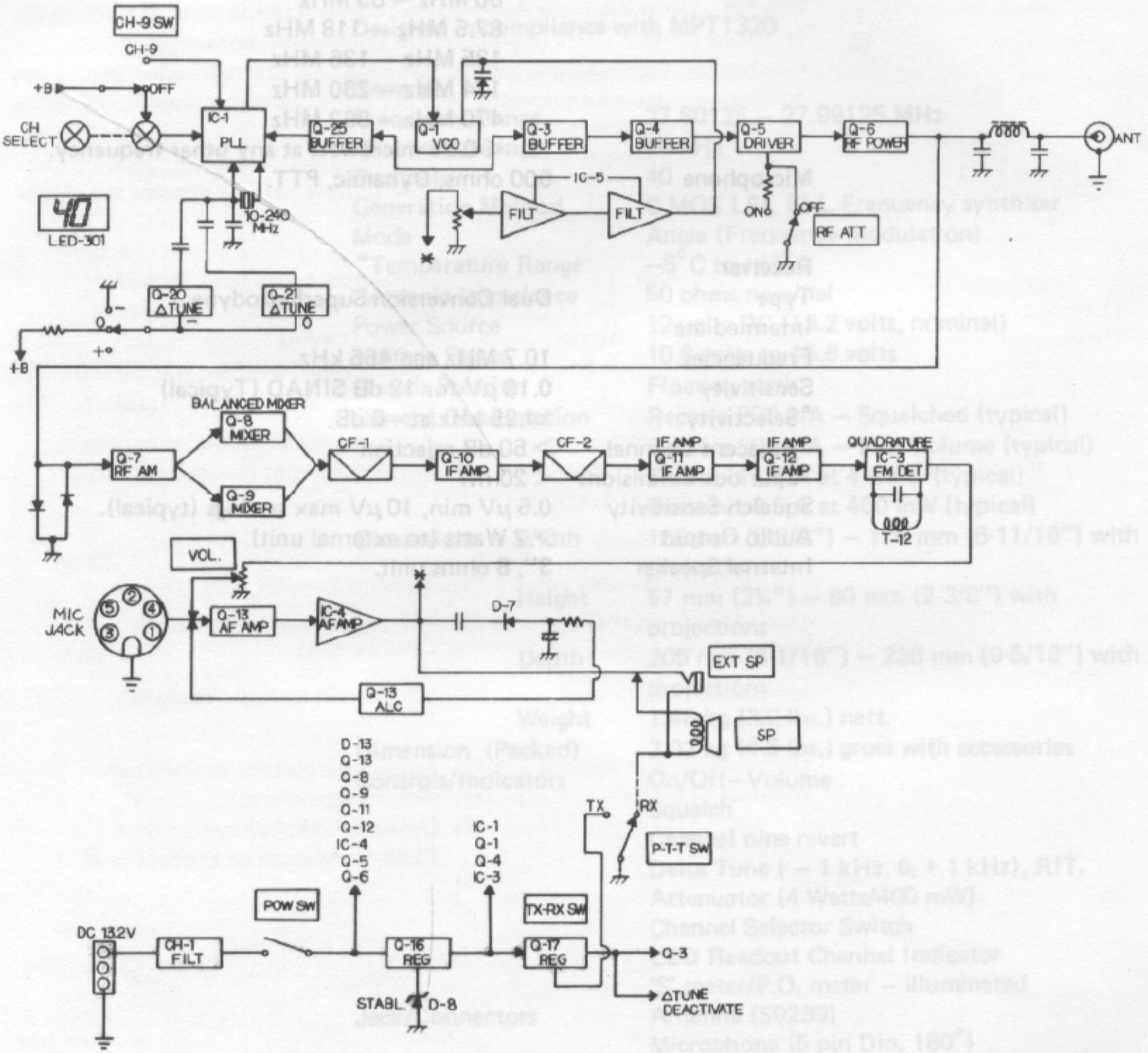
*Spurious Emissions	(1) < 50 nW within the following frequency bands – 80 MHz – 85 MHz 87.5 MHz – 118 MHz 135 MHz – 136 MHz 174 MHz – 230 MHz 470 MHz – 862 MHz (2) < 0.25 microwatt at any other frequency.
Microphone	600 ohms, Dynamic, PTT.

Receiver

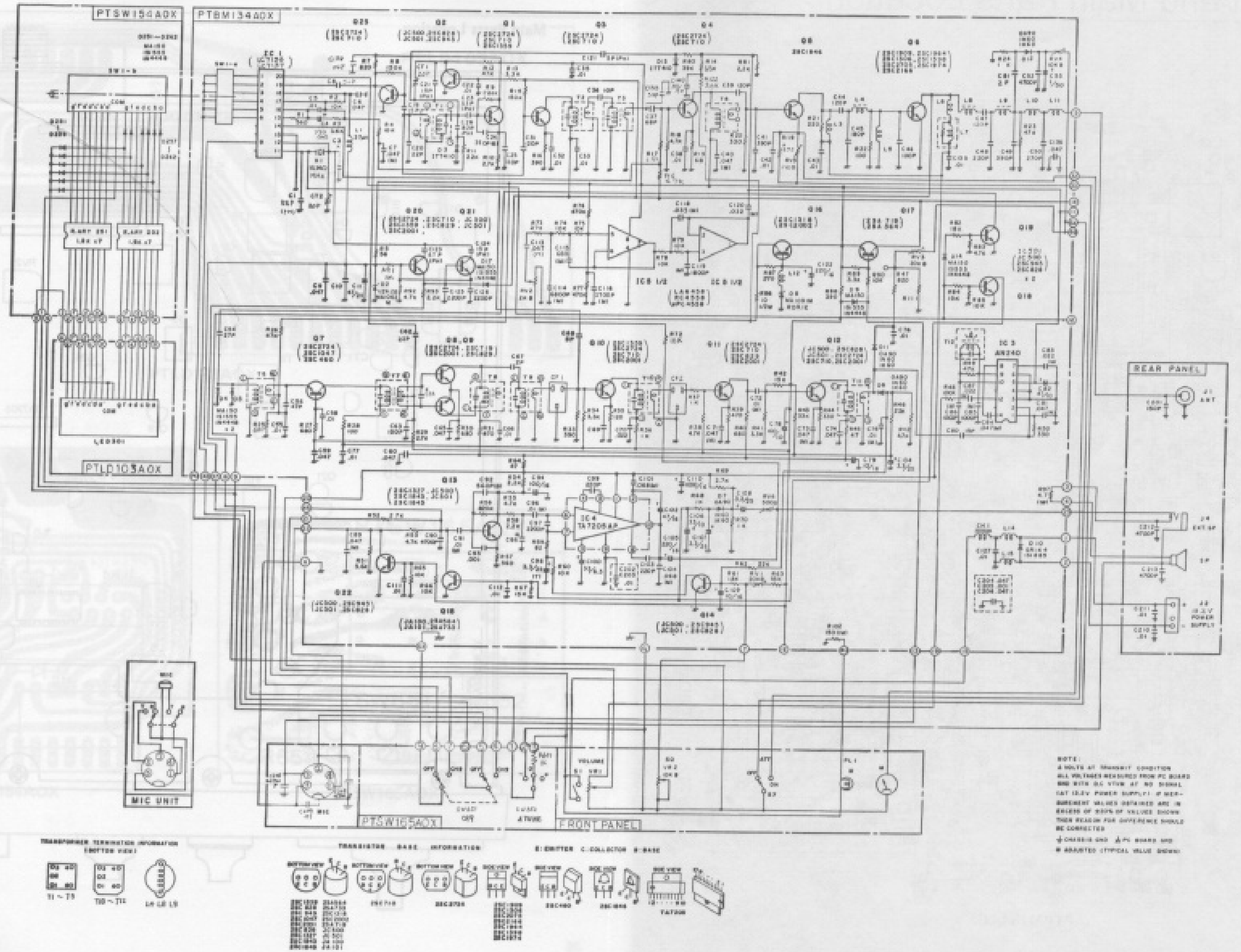
Type	Dual Conversion Superhetrodyne
Intermediate Frequencies	10.7 MHz and 455 kHz.
Sensitivity	0.19 μV for 12 dB SINAD (Typical)
*Selectivity	±4.25 kHz at –6 dB
*Adjacent Channel	> 50 dB rejection
*Spurious Emmisions	< 20 nW
Squelch Sensitivity	0.5 μV min, 10 μV max settings (typical).
Audio Output	> 2 Watts (to external unit)
Internal Speaker	3", 8 ohms unit.

* Specifications marked with an asterisk are taken from MPT 1320. Interested parties are invited to apply for a copy of a representive test result on a batch sample transceiver.

Block Diagrams

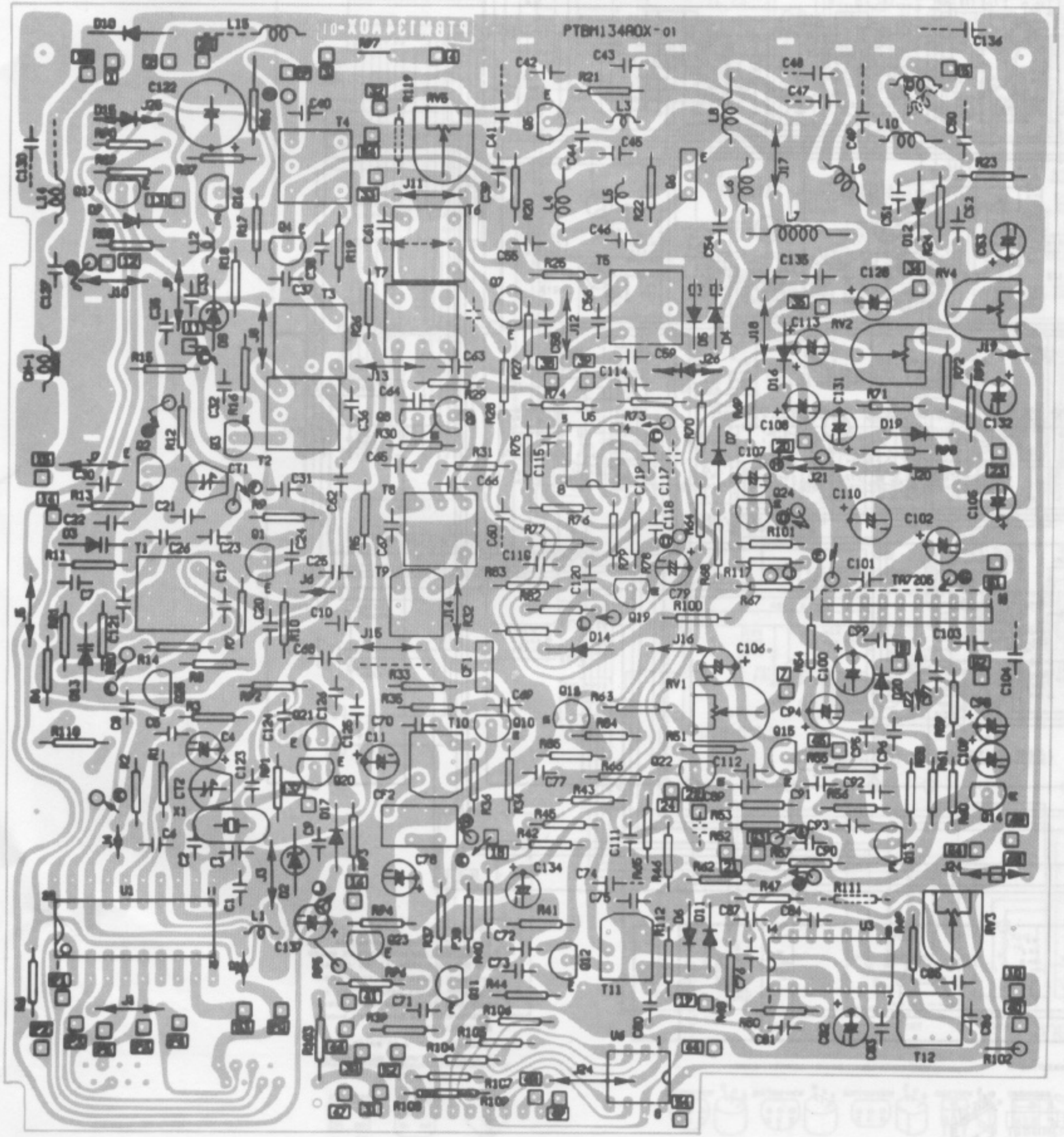


hematic Diagram CBM 271

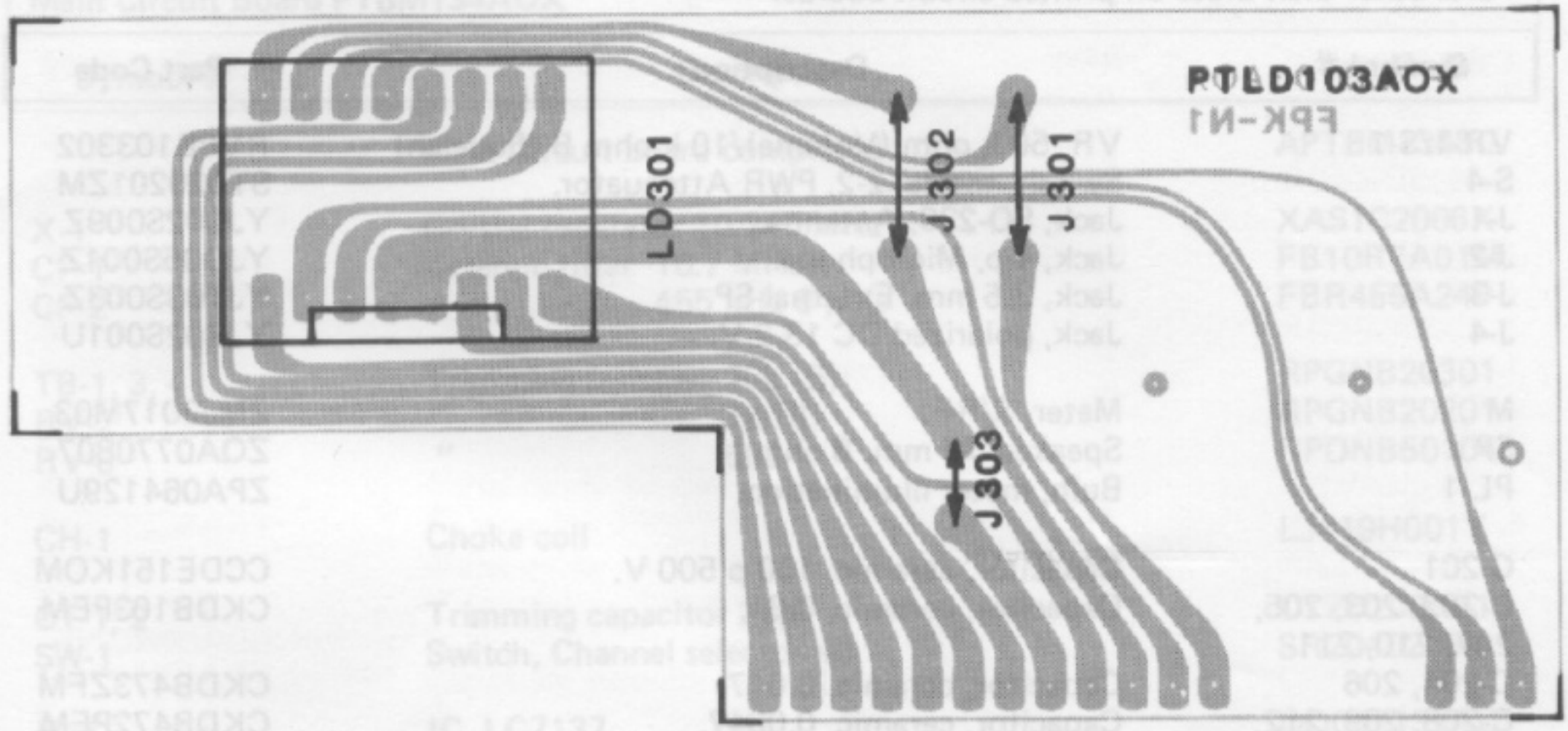


PCB Layout and Main Parts Location

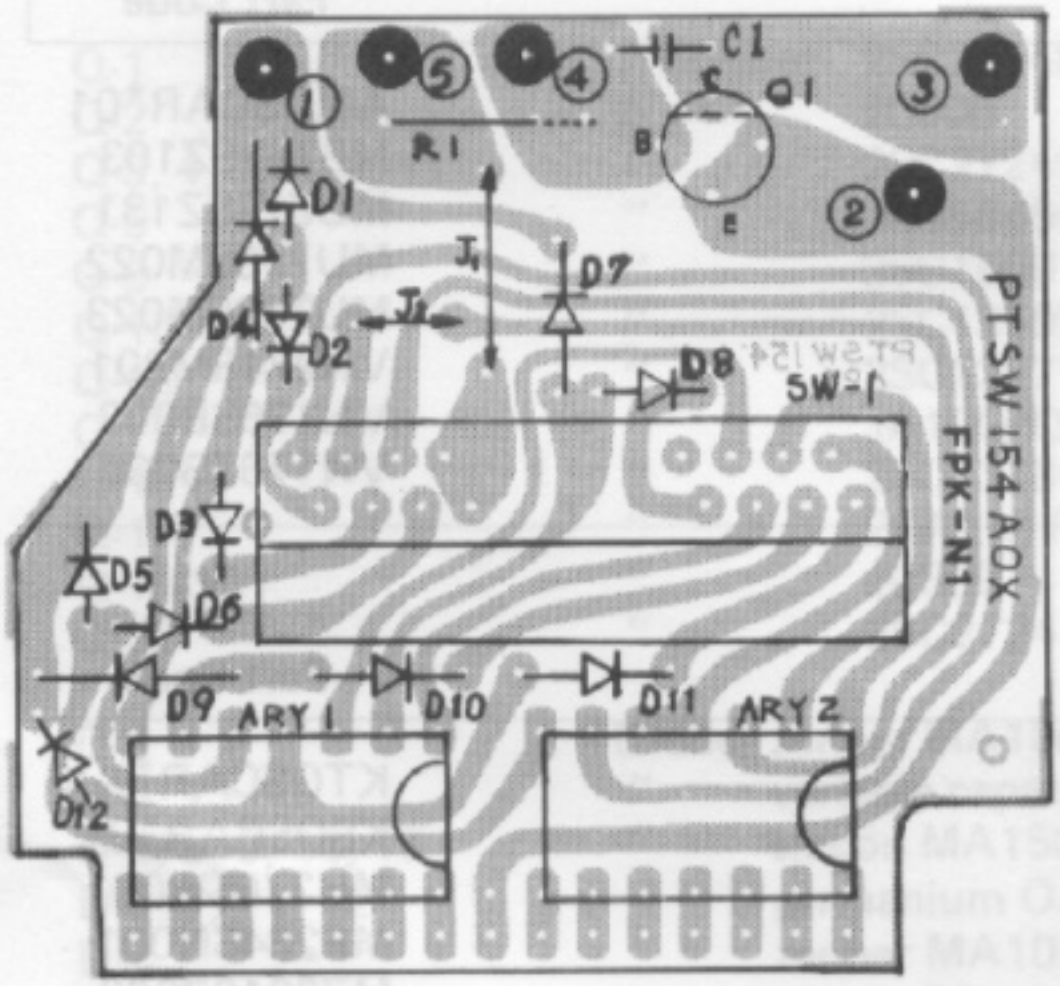
(08/19/81)



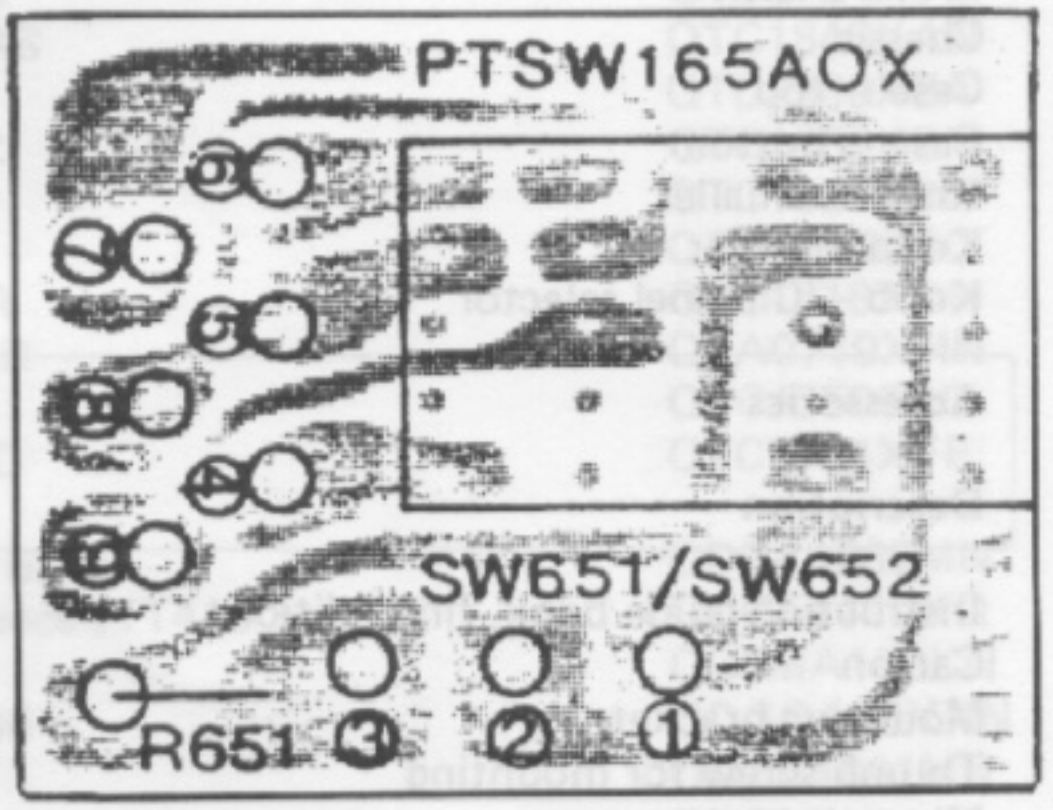
PTBM134AOX



PTLD103AOX



PTSW154AOX



PTSW165AOX

Parts List

Unless otherwise specified, resistors are in ohm; capacitors are in microfarad.

Parts other than those on printed-circuit-boards:

Symbol #	Description	Part Code
VR-1/S-1	VR, 50 k ohm (Volume)/10 k ohm B (Squelch)	RVPB103302
S-4	Switch, toggle, 2-2, PWR Attenuator.	ST020201ZM
J-1	Jack, SO-239, Antenna.	YJC02S009Z
J-2	Jack, 4-p, Microphone.	YJD05S001Z
J-3	Jack, 3.5 mm, External SP.	YJT03S003Z
J-4	Jack, polarized DC 13.2 V.	YJB02S001U
M	Meter, S/RF.	ZMJ2017M03
SP	Speaker, 77 mm, 8 ohm.	ZQA0770807
PL-1	Bulb, meter illumination.	ZPA064129U
C-201	Capacitor, ceramic, 150 p 500 V.	CCDE151KOM
C-202, 203, 205, 207, 210, 211	Capacitor, ceramic, 0.01.	CKDB103PEM
C-204, 206	Capacitor, ceramic, 0.047.	CKDB473ZFM
C-208, 209, 212, 213, 214	Capacitor, ceramic, 0.0047.	CKDB472PEM

Case Material	
Description	**Part Code**
Escutcheon completed	AMOSCAR*01
Front chassis	MB762SZ103
Chassis	MU677SZ131
Case – top	MU773SM022
Case – bottom	MU773SM023
Knob – smaller	VN274SM001
Knob – larger	VN176SB002
Knob – Channel selector	VN176SB006

Accessories	
Description	**Part Code**
Instruction guide book, first edition.	KTOSCAR*XX
Carton	KSOSCAR*01
Mounting bracket	MU276SW001
Thumb screw for mounting	MF284SN001
Microphone hanger	MZ331SZ002
DC power cord/in-line fused (2A)	ACDC083GEA
Microphone with DIN plug	ZGAAZ60150

Main Circuit Board PTBM134AOX		
Symbol #	**Description**	**Part Code**
	Main Circuit board completed	APTBM134SG
X-1	Crystal oscillator 10.240 MHz	XAS1C2006X
CF-1	Ceramic filter 10.7 MHz	FB10R7A01M
CF-2	" 455 kHz 6-pole	FBR455A24P
TB-1, 3, 4	Trimming resistor 20k (B)	RPGNB20301
RV-2	" 2k (B)	RPGNB20201
RV-6	" 500	RPDNB50104
CH-1	Choke coil	LJ119H001Y
CT-1, 2	Trimming capacitor 20p	CTZ6200H01
SW-1	Switch, Channel selector 40	SR2040205H
IC-1	IC LC7137	QQ007137AC
IC-3	" AN240	QQMAN240PN
IC-4	" TA7205P	
IC-5	" LA6458	QQM06458AC
Q-1	Transistor 2SC2724D	QTC2724XDE
Q-2	" JC500	QTCJC500BQ
Q-3, 4, 7, 8, 9, 11	" 2SC2724CD	QTC2724XFE
Q-5	" 2SC1846QRS	QTC1846XAN
Q-6	" 2SC1909	QTC1969XBA
Q-10	" 2SC1359BC	QTC1359XBN
Q-13	" 2SC1327T	QTC1327XBN
Q-15	" JA100PQ	QTAJA100BQ
Q-16	" 2SC1318QR	QTC1318XDN
Q-17	" 2SA719 PQR	QTA0719XHN
Q-18-22	" JC500	QTCJC500DQ
Q-25	" 2SC2724 CD	QTC2724XFE
D-2	Diode zenner MA1062 6.2V	QDZA1062MN
D-3, 13	" variable capacitance ITT410	QDCTT410XQ
D-4, 5, 9, 14, 17	" silicon MA150	QDSMA150XN
D-6, 7, 11, 12	" germanium OA90	QDGOA90XXN
D-8	" zenner MA1091	QDZA1091MN
D-10	" silicon SR1K4	QDSSR1K4AP
T-1	RFC	TR10DB003M
T-2	"	TR10CB003T
T-3	"	TR10CA006T
T-4	"	TR10CP005S
T-5	"	TR10MP003T
T-7	"	TR10CM003M

Symbol #	Description	Part Code
T-8	RFC	TR10MA018M
T-9	"	TR07MA006N
T-10	"	TR07LA004N
T-11, 12	"	TR07LA023N
L-1	Coil peaking 27 micro-H	LF270KD01N
L-3	" 2.2 micro-H	LF2R2KD01N
L-4	"	TRA5CZ001M
L5, 12	" 68 micro-H	LF680KD01N
L-6	"	LA1KE1011A
L-7	"	LDADX3825M
L-8	"	TRA5CZ002M
L-9	"	TRA5CZ003M
L-10	"	LA1JG1010A
L-11	"	LA1KE1211A
L-14	"	LDAD84024B
L-15	"	LDADB4024B
R-1	Resistor carbon ¼w 560	RD25PJ561X
R-2, 4, 60, 65, 66, 72, 74, 75, 78, 79, 85, 90	" 10k	RD25PJ103X
R-3, 51, 122	" 5.6k	RD25PJ562X
R-5	" 560	RD25PJ560X
R-6, 53	" 4.7k	RD25PJ472X
R-7	" 820	RD25PJ821X
R-8, 15	" 150k	RD25PJ154X
R-9	" 220k	RD25PJ224X
R-10, 29, 69	" 2.7k	RD25PJ272X
R-11, 62	" 22k	RD25PJ223X
R-12, 23, 26, 49	" 47k	RD25PJ473X
R-13, 34, 41, 89	" 3.3k	RD25PJ332X
R-14, 17	" 6.8k	RD25PJ682X
R-16, 33, 88	" 390	RD25PJ391X
R-18, 38, 55, 83, 92, 112	" 4.7k	RD25PJ472X
R-19	" 68	RD25PJ680X
R-20, 44, 50	" 330	RD25PJ331X
R-21	" 220	RD25PJ221X
R-22	" 10	RD25PJ101X
R-24, 36, 37, 68, 70, 91	" 1k	RD25PJ102X
R-25, 27, 30, 40	" 680	RD25PJ681X
R-28	" 100	RD25PJ100X
R-31, 39	" 470	RD25PJ471X
R-35	" 120	RD25PJ121X
R-42, 67, 84	" 15k	RD25PJ153X
R-43	" 33k	RD25PJ333X
R-45, 64	" 47	RD25PJ470X

Symbol #	Description	Part Code
R-46	Resistor carbon ¼w 22k	RD25PJ223X
R-47	" 820	RD25PJ821X
R-48	" 100k	RD25PJ104X
R-52, 73	" 27k	RD25PJ273X
R-54, 58, 81, 93	" 2.2k	RD25PJ222X
R-56	" 820k	RD25PJ824X
R-59	" 82	RD25PJ820X
R-61	" 1.8k	RD250PJ182X
R-63, 82	" 18k	RD25PJ183X
R-76, 77	" 470k	RD25PJ474X
R-80	" 39k	RD25PJ393X
R-86	Metal-oxide 10 ½w	RXHANJ100B
R-87, 119	Carbon ¼w 270	RD25PJ271X
R-97	Metal-oxide 4.7 1w	RX1ANJ4R7B
R-102	" 150 1w	RG1ANJ151B
C-1	Capacitor ceramic 56p	CCFB560KPM
C-3	" 22p	CCDB220KPM
C-4	" electrolytic 1/50V	CEAG010ZMN
C-5, 10, 22, 30, 32, 33, 35, 38, 42, 43, 55, 58, 66, 77, 111, 112	" ceramic 0.01	CKDB103PEM
C-6, 9, 59, 60, 65, 74	" 0.047	CKDB473ZFM
C-7, 40, 71, 73, 81, 84, 89, 113	" mylar 0.047 50V	CQMB473KEH
C-8	" ceramic 39p	CCFB390KOM
C-11	" electrolytic 47 25V	CEAE470ZLS
C-19	" ceramic 18p	CCFB180KOM
C-20	" 22p	CCDB220KOM
C-21, 80	" 15p	CCFB150KPM
C-23	" 33p	CCDB330KPM
C-24	" 330p	CKDB331KBM
C-25, 31, 39, 44	" 120p	CCFB121KOM
C-26	" 82p	CCDB820KPM
C-36	" 10p	CCFB100DOM
C-37	" 68p	CCDB680KOM
C-41, 49	" 390p	CCFB391KOM
C-45	" 180p	CCDB181KOM
C-46	" 100p	CCFB101KOM
C-47	" 120p	CCFB121KOM
C-48, 99, 103	" 220p	CCDB221KOM
C-50	" 270p	CCFB271KOM
C-51, 67	" 2p	CCFB020COM
C-52, 90	" 0.0047	CKDB472PEM
C-53	" electrolytic 1/50V	CEVG010ALX
C-54	" ceramic 27p	CCFB270KOM
C-56	" 47p	CCFB470KOM

Symbol #	Description	Part Code
C-63	Capacitor 150p	CCFB151KOM
C-68	" 5p	CCFB050COM
C-70	" 0.022	CKDB223ZFM
C-72, 75, 76, 91, 96	" mylar 0.01	CQMB103KEH
C-78	" electrolytic 100/10V	CEAC101ALX
C-79, 109	" 10/16V	CEAD100ALX
C-82	" 47/10V	CEAC470ALX
C-83, 87	" mylar 0.022	CQMB223KTH
C-85, 86	" 1000p	CQMB102KEH
C-92	" ceramic 560p	CKDB561KBM
C-93	" 0.001	CKFB102PEM
C-94	" electrolytic 100/16V	CEAD101ALX
C-97	" ceramic 0.0022	CKDB222PEM
C-98	" tantalum 3.3/25V	CSSE3R3MDC
C-100	" electrolytic 3366.3V	CEAB330ALX
C-101, 104	" mylar 0.068	CQMB683KEM
C-102	" electrolytic 47/16V	CEVD470ALX
C-105	" 220/16V	CEAD221ALX
C-106	" 33/10V	CEVC330ALX
C-107, 108	" 3.3/25V	CEVE3R3ALX
C-110	" 1000/16V	CEED102ALX
C-114	" mylar 6800p	CQMB682KEH
C-115, 118	" 0.033	CQMB272KEH
C-116	" 2700p	CQMB272KEH
C-119	" 1800p	CQMB182KEH
C-120	" 0.022	CQMB223KTH
C-121	ceramic 5p	CCFB050CPM
C-122	" electrolytic 220/16V	CEAD221ALX
C-123	" ceramic 47p	CCFB470KPM
C-124	" 18p	CCFB180KPM
C-125, 126	" 220p	CKFB222PEM
C-127, 135	" 0.01	CKFB103PEM
C-130, 136, 138	" 0.047	CKDB473ZFM
C-134	" electrolytic 3.3/25V	CEAE3R3ALX
C-139	" ceramic 39p	CCDB390KOM
C-140	" electrolytic 33/10V	CEAC330ALX

Main Parts Location

