

M2

Serial No:

009481



**INSTRUCTION MANUAL FOR
40 CHANNEL FM SOLID STATE
CITIZENS BAND 2-WAY RADIO**

SPECIFICATIONS

GENERAL

Channels	40
Frequency Range	27.60125 to 27.99125 FM
Frequency Control	Crystal Phaselock Synthesizer
Frequency Tolerance	$\pm 0.005\%$
Frequency Stability	$\pm 0.002\%$
Operating Temperature Range	-5°C to +45°C
Microphone	Plug in 4 pin Dynamic Type
Input Voltage	13.8V DC (Positive or Negative Ground)
Current Drain	Receive: 1.5A at maximum audio Output: 0.5A standby (no signal)
Size	190mm x 146mm x 51mm
Weight	1.25 Kilograms
Antenna Connector	Standard SO 239 Type
Semiconductors	14 Transistor 4 IC 16 Diode 1 FET
Meter	Illuminated, indicates relative power output and received signal strength.
Channel Indicator	Green LED
Power Bandwidth	10.5 V to 16 V
Attenuator	10 dB Attenuator fitted as standard
Circuit Protection	Able to sustain an SWR reading of 20 : 1 for up to 5 minutes

TRANSMITTER

FM Power	4 watts/0.4 watts as specified in MPT 1320 via Hi/Lo Attenuator of 10 dB -
Modulation	High and Low Frequency Modulation
FM Deviation	up to ± 2.5 KHz

Frequency Response	400 Hz — 2.4 KHz
Output Impedance	50 Ohms Unbalanced
Output Indicators	Meter shows relative RF Power Output, receiving signal strength, Mod-Tmx Lamp indicates Transmit Mode.
Harmonic Suppression and Spurious Emissions	Better than required in MPT 1320

RECEIVER

Sensitivity	1 μ V for 10 dB S/N
Signal to Noise Ratio at 20 dB	2 μ V
Selectivity	5 KHz
Image Rejection	More than 45 dB
IF Rejection	50 dB
Automatic Gain Control (AGC)	100 dB
Squelch	0.1 μ V — 1.5 μ V
Audio Frequency Response at 10dB	250 Hz — 2.5 KHz
Distortion	Less than 5%
Adjacent Channel Rejection	More than 80 dB
Cross Modulation	More than 50 dB
IF Frequency	455 KHz/10.695 MHz
Audio Output Power	3 W into 8 Ohm (10% distortion)
Built in Speaker	8 Ohms
External Speaker (Optional)	8 Ohms; disconnects internal speaker when connected.

SECTION I

INSTALLATION

WARNING

Operation of this equipment requires a valid Licence issued by the The Post Office. Do not transmit with your equipment until you have obtained your licence. Illegal operation can result in severe penalties. Be sure that you read all the regulations specified in the licence before operating your transmitter.

Location

Plan the location of the transceiver and microphone bracket before starting the installation selecting a location that is convenient for operation and that does not interfere with the driver or passengers in the vehicle. In most motor vehicles, (except motor cycles) the transceiver is usually mounted to the underneath of the dash panel, with the microphone bracket beside it.

Mounting and Connection

Your transceiver is supplied with a universal mounting bracket. The transceiver is held in the bracket by two (2) bolts, permitting adjustment to the most convenient angle.

The bracket must be mounted with the machine screws and the nuts supplied, the mounting must be mechanically strong and also provide a good electrical connection to the chassis of the vehicle. Then proceed to mount the transceiver as follows:

1. After you have determined the most convenient location in your vehicle, hold the radio complete with mounting bracket loosely fitted in the exact location required. Providing nothing will interfere with the mounting in the position you have decided, remove the mounting bracket from the transceiver and use this bracket as a template to mark the location for the mounting bolts. Before commencing drilling, check that nothing will interfere with the mounting bolts and also check that there are no wires behind where you are going to drill that you may damage.
2. Drill out the holes and trim off any excess metal and then mount the bracket with the machine screws supplied and tighten up these screws as much as possible without straining or stripping the threads.
3. Connect the antenna cable plug to the SO 239 receptacle on the rear of the set. The majority of CB antennas are terminated with a type PL-259 plug and this mates with the SO 239 receptacle on the rear panel of the set.

4. Connect the microphone to the set and attach the microphone clip in the position that you have connected.
5. Only when you have completed operations 1 to 4 should you now connect the power cord plug to the DC power socket on the rear panel of the unit.
6. **NEGATIVE GROUND SYSTEMS** — Almost all cars, buses and trucks are negative earth systems. The red lead at the end of the power cord connects to the positive terminal (+) of the battery or electrical system, and the black lead connects to the negative terminal (-) on the battery or to a suitable chassis earth point.

NOTE

In Position Earth Vehicles connect the red lead to the negative (-) terminal of the battery or suitable chassis earth point, and the black lead to the positive (+) terminal of the battery or electrical system.

Providing that you have a licence as mentioned; you are now nearly ready to join the millions of users of Citizens Band Radio; but to protect your investment, we highly recommend that you either take your car, bus or truck to your dealer to have him check that your antenna is fully matched with your transceiver, i.e. that the Standing Wave Ratio (SWR) is correct. To explain very briefly, the actual length of your antenna makes a difference to the way your transceiver performs.

What you are trying to achieve is that you are transmitting as much power as possible through your antenna as is allowed by the Home Office, and that as little power as possible is being Reflected (REF) back through your antenna cable and antenna into your transceiver, which could damage the transceiver power transistors. What you are trying to achieve is as much Forward (FWD) power as is allowed to enable you to obtain the benefit of this top quality transceiver, and use it to get the maximum range possible, using legal equipment.

If you have decided to have a go at this yourself and you have armed yourself with an SWR Meter and a Patch Lead, we will talk you through the very basics of this check.

1. Ensure that your transceiver is turned off.
2. Uncouple the antenna plug from the back of the panel and plug this into the SWR Meter at the side where it says ANT. Using the Patch Lead, couple one end into the back of the transceiver and the other end into the SWR Meter where it reads XMTR and you are ready to go.
3. Switch on the transceiver and turn to channel 1, on the SWR meter you will see a two (2) position switch marked FWD and REF, move this switch to FWD and press the transmit button on the microphone. You should see the needle on the SWR meter move clockwise across the dial and using the rotary control above the FWD/REF switch position the needle on the SET mark. Without touching the rotary control, move the FWD/REF switch to REF switch and you should see the needle move back across the scale and take note of where it stops.

4. Release the transmit button and change to channel 40 and carry out the same procedure again and note where the needle stops on REF you are now ready to carry out some final adjustments to your antenna.

A very quick guide is that ideally, you are trying to trim your antenna so that the SWR meter needle moves as little as possible from channel 1 to 40 when carrying out the checks previously described. If the reading is higher on channel 40 than on channel 1 then the antenna needs shortening. If it reads lower on channel 40 than channel 1 then it needs lengthening.

5. The instructions on your antenna will tell you how to go about lengthening or shortening the antenna, but do not take off too much at a time only about 1/4" until such time as you have the least possible movement on the SWR meter scale on channel 1 and 40, then do a final check on channel 20 and you should find the scale hardly moves at all on this channel.

Ideally you are looking for a reading of 1.1:1 on your scale, readings of up to 2:1 are acceptable but will reduce performance. Readings of 3:1 and above are not acceptable and could cause damage to your transceiver. Once you have reached the best possible SWR you can either leave the meter permanently in line as a continual reference, or, turn the transceiver off and uncouple the Patch Lead and the SWR Meter and screw the antenna lead back into the rear of the transceiver, and you are now ready to transmit.

Ignition Noise Interference

Use of a mobile transceiver at low signal levels is normally limited by the presence of electrical noise. The primary source of noise in most vehicles is generated from the Alternator/Dynamo and the ignition system in the vehicle. Under most operating conditions, when the signal level is adequate, the background noise does not present a serious problem. Also when extremely low level signals are being received, the transceiver may be operated with the vehicle engine turned off as the unit requires very little current and will therefore not drain the battery. Even though your transceiver has a selective automatic noise limiter, in some installations ignition interference may be high enough to make good communications impossible. These noises come from several sources and many possibilities and variations between vehicles may require different solution to reduce the noise.

Antenna

Since the maximum Effective Radiated Power (ERP) output of the transceiver via the antenna is limited by the Home Office of Two (2) Watts (ERP). The antenna is one important factor affecting transmission distance, and only a properly matched antenna will allow maximum power transfer from the 50 Ohm transmission line to the radiating element. This must be of the type recommended in your licence by the Home Office, and how to get the maximum performance out of this is dealt with in item 2 on the use of an SWR meter in this instruction book.

Mobile whip antennas utilise the metal body of the vehicle as a ground plane and when mounted at the corner of the vehicle, they are slightly directional in the direction of the body of the vehicle. For all practical purposes however, the radiation pattern is non-directional, and the slight directional characteristic will only be observed at extreme distances. A standard SO 239 antenna connector is provided on the transceiver for easy connection to standard PL-259 cable termination.

If the transceiver is not mounted on a metal surface, it may be necessary to run a separate ground or earth wire from the unit to a good metal electric earth in the vehicle.

When installed in a boat, the transceiver will not operate at maximum efficiency without a ground plane unless the vessel has a steel hull.

Before installing your transceiver in a boat, consult your dealer for all information regarding adequate grounding systems and the prevention of electrolysis between fittings in the hull and the water.

Base Station Operation

(Operation from 220-240 AC Domestic current)

To operate your transceiver from your home or office, using the regular domestic electricity as the power source, you will require a separate power supply capable of supplying at least 2 amps at 13.8 V DC output. Simply connect the Red (+) and Black (-) leads from the transceiver to the corresponding terminals of the AC power supply.

NOTE

Do not attempt to operate this transceiver by connecting directly to the Mains 220/240 volt AC power.

When operated as a Base Station reference must be made to the regulations laid down by the Home Office as to the length of antenna used and its height before operation. Failure to use the correct legal antenna may result in severe penalties.

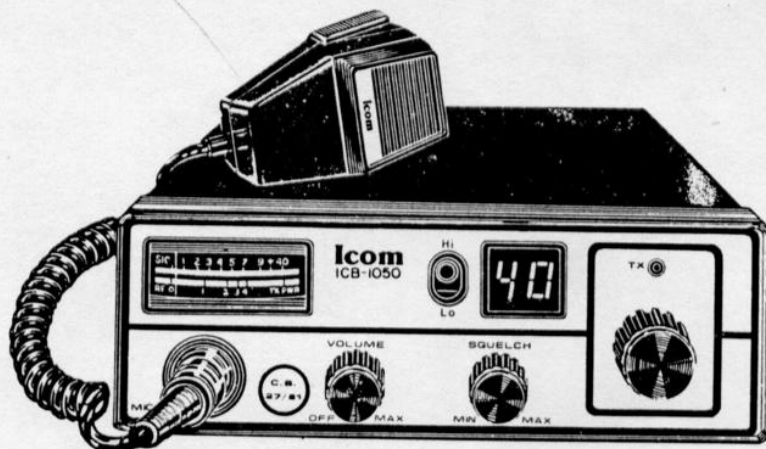
Remote Speaker

The external speaker jack (EXT SPKR) on the rear panel is used for remote receiver monitoring. The external speaker should have 8 Ohms impedance and be capable of handling at least 3 Watts. When an external speaker is connected, the internal speaker is disconnected.

SECTION II

OPERATION

CONTROLS AND INDICATORS



A. CONTROLS AND FUNCTIONS

- 1. VOLUME/ON/OFF SWITCH.** Turn clockwise to switch on transceiver and set to the desired listening level.
- 2. SQUELCH.** This control is used to cut off or eliminate receiver or FM background noise in the absence of an incoming signal. For maximum receiver sensitivity it is recommended that the control be adjusted only to the point where the receiver/FM background noise is eliminated. Turn fully counterclockwise, then slowly clockwise until the receiver noise disappears. Any signal to be received must now be slightly stronger than the average received noise. Any further movement clockwise of the control will increase the threshold level which the signal must overcome in order to be heard. Only very strong signals will be heard at a maximum clockwise setting. You may experience intermittent popping sounds or very garbled background voices

on certain channels and this is caused by operators of units both in U.K. and abroad which have a sideband facility (SSB) which is not allowed by U.K. legislation, sometimes breaking across your incoming signal. This is called "Bleeding Across" but this should not inconvenience your operation as by careful use of the squelch control, the majority of these signals can be blanked out.

On first hearing this type of interference, you may well think that your set is faulty, but if you are at all unsure, please contact your local dealer and he will explain this in detail to you and show you how to overcome the problem.

CHANNEL SELECTOR

This control selects any one of the forty (40) Citizens Band channels desired for use. Whilst no actual hard and fast rules have been laid down by the Home Office, it is recommended that Channel 19 be reserved for the Mobile Channel for use by people who are on Motorways and Main roads so that if an emergency happens such as a Road Accident, or long traffic queues, this matter can be passed on to either the emergency services or to other road users to save time and hopefully lives. Channel 9 should be reserved for pure emergency use so that assistance can be immediately obtained should an emergency arise, from one of the many organizations such as REACT who constantly monitor this channel.

It is also hoped that a general calling manual (Breaker Channel) will be established so that you know exactly which channel to go to for contacting people in whichever area you happen to be.

The Channel Selector is digitally displayed in the Channel Window alongside the Channel Selector Control.

HI/LO SWITCH

This operates the 10 dB attenuator and reduces the actual power from your transceiver from 4 watts to 0.4 watts and must be used in any installation where the antenna exceeds the legislation laid down by the Home Office. You will also find that by using the lower power setting in town and country, you will achieve a much clearer speech pattern over distances of up to 2 miles, and the person whom you are talking to will also benefit from this and you should experiment with your friends as to the exact range that is obtainable on this setting.

NOTE. When the HI/LO switch is on the LO setting, your needle will not move so far across the dial, this is because you are only using 1/10th of the normal power, but this has no effect on signal strength on reception.

B. INDICATORS

- 1. POWER/S METER.** Sometimes referred to as the S + RF Meter, this shows relative transmitter power when transmitting and input signal strength when receiving. You will, however, find that FM receptions, on many occasions, you can receive a signal quite clearly and fully understand what the other user is talking about without your needle moving. This is one of the peculiarity of FM where as on the non legalised AM type of transceiver the actual carrier wave which the transceiver puts out and which carried your voice remains constant, and your actual speech signal causes this carrier to change its amplitude whereas on FM transceiver, the RF amplitude carrier remains constant, and your speech signal causes the frequency to change up and down. So whilst the actual barrier that you are receiving may be weak and not moving your needle, the speech signal is strong and this is the part you wish to hear.

2. **MOD-TMX LAMP.** This lamp will glow faintly red when your transceiver is on receive, and will glow much brighter when you actually key your microphone to talk.

C. PRESS-TO-TALK MICROPHONE

The receiver and transmitter are controlled by the press-to-talk (PTT) switch on the microphone which in turn is connected to the transceiver via the 4 pin plug on the left hand side of the transceiver front case. Press the switch and the transmitter is activated, release the switch to receive. When transmitting hold the microphone about two (2) inches from your mouth and talk clearly in a normal voice. The transceiver comes complete with a low impedance, dynamic microphone.

D. OPERATING PROCEDURE

1. Turn the set ON by turning the VOLUME control clockwise until a click is heard.
2. Set the VOLUME for comfortable listening.
3. Listen to the background noise from the speaker and then turn the SQUELCH slowly clockwise until the noise just disappears (No signal should be present). Leave the control at this setting and the SQUELCH should be now properly adjusted to allow signals to break through the threshold whilst the transceiver remains quiet. The receiver will remain quiet until a signal is actually received. Do not advance the control too far or some of the weaker signals will not be heard.
4. Set the CHANNEL selector switch to the desired channel.

E. OPERATING PROCEDURE TO TRANSMIT

1. Select the chosen channel for transmission.
2. If the channel is clear, depress the PTT switch and the microphone, the transmit light will glow bright and you are ready to go.

Just a few small but important don't.

Please do not swear on channel, it not only causes embarrassment to other people, but could well cause you severe problems with Government officials who will be monitoring.

Don't Advertise.

Try not to interfere with other people who may be using the airways.

Don't after making contact with another breaker, stay on the breaker channel.

Don't give out an emergency or 10-33 call unless you are sure that it is genuine.

PARTS LIST

Symbol No.	Description
IC101	IC MC-3357P
IC201	IC MC-145106P/LC-7137
IC202	IC KIA-7310/AB-103/TA-7310
IC301	IC KIA-7205CP/TA-7205CP
Q101	2SC 380TM
Q102	2SC 380TM
Q103	2SC 380TM
Q201	2SC 380TM
Q202	2SC 380TM
Q203	2SA 1015Y
Q204	2SC 1815GR
Q205	2SC 380TM
Q301	2SC 1815GR
Q302	2SC 1815GR
Q303	2SC 1815GR
Q304	2SC 1173-O
Q305	2SC 2314-F
Q306	2SC 2078D/2SC-1306
F101	3SK-45B/3SK-107
D101	Diode IS2473/IN4148
D102	Diode IS2473/IN4148
D103	Diode IS2473/IN4148
D104	Diode IS2473/IN4148
D105	Diode IS2473/IN4148
D201	Diode IS2473/IN4148
D202	Diode IS2473/IN4148
D203	Zener Diode GZA5.1, 5V 500mw
D204	SVC-251
D205	SVC-251
D206	Diode IS2473/IN4148
D207	Zener Diode GZA10, 9.7V 500mw
D301	Diode IS2473/IN4148
D302	Diode IS2473/IN4148
D303	Diode IN4002/10DI/DS 135E/30DI
D304	Diode IS2473/IN4148
CF101	Ceramic Filter SFE10.7 MS2(RED)
CF102	Ceramic Filter CFU455G2
CF103	Ceramic Filter CFU455G2
CT201	Trimer 20PF 6.5 ϕ /5 ϕ
CT202	Trimer 20PF 6.5 ϕ /5 ϕ
CT203	Trimer 20PF 6.5 ϕ /5 ϕ
X201	Crystal 16.50625MHZ
X202	Crystal 16.96125MHZ
X203	Crystal 10.240MHZ
	LED Lamp 3 ϕ Red
	LED Display UL-2231 Green
	ANT. Connector W/Washer
	Earphone Jack W/Washer
	3.5 ϕ
	Speaker 8 ohm 3" 2W
	Meter 240 Micro Ampere
VR101	Volume 10Kohm (SW)
VR102	Volume 5Kohm
T309	Choke Transformer EI-19
SW101	Slide Switch 2P2C KSA-221E

Symbol No.	Description
	Rotary Switch GPS-0372
	Microphone W/Connector
	Plug Assy 500 ohm Dynamic
	Nut Locker
	Silicon Grease
	Wax Micro 3Kg/GA
	Power Cord W/Fuse Holder
	Foam Flux
	PCB Main
	PCB Switch
	PCB LED
	Empire Tube 1 ϕ
	Empire Tube 2 ϕ
	Binding Tube
	Jump Wire 0.6 ϕ
T101	IFT 7mm 27MHZ A
T102	IFT 7mm 27MHZ B
T103	IFT 7mm 10.7MHZ
T105	IFT 7mm 455KHZ B
T201	IFT 10mm 10.240MHZ
T202	IFT 10mm 16MHZ VCO
T207	IFT 10mm TX27MHZ A
T208	IFT 10mm TX27MHZ B
T209	IFT 10mm TX27MHZ C
T301	IFT 10mm TX27MHZ D
T303	IFT 10mm TX27MHZE
T305	IFT 10mm TX27MHZ F
T307	IFT 10mm TX27MHZ G
L106	Microinductor 5.6mH
L203	Microinductor 100 μ H
L204	Microinductor 22 μ H
L205	Microinductor 470 μ H
L206	Microinductor 470 μ H
L302	Choke Coil A 2.2 μ H
L304	Microinductor 6.8 μ H
L306	Choke Coil B 0.3 μ H
L308	Choke Coil C 0.51 μ H
L310	Choke Coil D 0.51 μ H
L311	Spring Coil 0.26 μ H
RV101	Semi Fixed R100K B 8 ϕ
RV301	Semi Fixed R5KB 8 ϕ
RV302	Semi Fixed R50KB 8 ϕ
RV303	Semi Fixed R10KB 8 ϕ
R101	Carbon R56K Ω
R102	Carbon R330K Ω
R103	Carbon R270K Ω
R104	Carbon R100 Ω
R105	Carbon R100 Ω
R106	Carbon R22K Ω
R107	Carbon R10K Ω
R108	Carbon R1K Ω
R109	Carbon R100 Ω
R110	Carbon R3.3K Ω
R112	Carbon R150K Ω
R115	Carbon R100K Ω
R117	Carbon R1K Ω Straight
R118	Carbon 2.2K Ω
R119	Carbon R1.8K Ω
R120	Carbon R10K Ω

Symbol No.	Description
R121	Carbon R2.2K Ω
R122	Carbon R2.2K Ω
R123	Carbon R47K Ω
R124	Carbon R100K Ω
R125	Carbon R330K Ω
R126	Carbon R470 Ω
R128	Carbon R22K Ω
R130	Metal Oxide R10 Ω /2W
R131	Carbon R27K Ω
R133	Carbon R10K Ω
R201	Carbon R1.5K Ω
R202	Carbon R1.5K Ω
R203	Carbon R1.5K Ω
R204	Carbon R1.5K Ω
R205	Carbon R1.5K Ω
R206	Carbon R1.5K Ω
R207	Carbon R1.5K Ω
R208	Carbon R1.5K Ω
R209	Carbon R1.5K Ω
R210	Carbon R1.5K Ω
R211	Carbon R1.5K Ω
R212	Carbon R1.5K Ω
R213	Carbon R1K Ω
R214	Carbon R1.5K Ω
R215	Carbon R47 Ω
R216	Carbon R27K Ω
R217	Carbon R150 Ω
R218	Carbon R1K Ω
R219	Carbon R22K Ω
R220	Carbon R47 Ω
R221	Carbon R1.5K Ω
R222	Carbon R1.5K Ω
R223	Carbon R2.2K Ω
R224	Carbon R10K Ω
R225	Carbon R10K Ω
R226	Carbon R330 Ω
R227	Carbon R100 Ω
R228	Carbon R1K Ω
R229	Carbon R120 Ω
R230	Carbon R100K Ω
R231	Carbon R1K Ω
R232	Carbon R150 Ω
R233	Carbon R10K Ω
R234	Carbon R100 Ω
R235	Carbon R100 Ω
R236	Carbon R470 Ω
R237	Carbon R2.7K Ω
R238	Carbon R4.7K Ω
R239	Carbon R22 Ω
R240	Carbon R47 Ω
R241	Carbon R47 Ω
R242	Carbon R100K Ω
R243	Carbon R680 Ω
R301	Carbon R10K Ω
R302	Carbon R22K Ω
R303	Carbon R1.5K Ω
R304	Carbon R3.3K Ω
R305	Carbon R10K Ω
R306	Carbon R33K Ω
R307	Carbon R1K Ω

Symbol No.	Description
R308	Carbon R150 Ω
R309	Carbon R4.7K Ω
R310	Carbon R10K Ω
R311	Carbon R220K Ω
R312	Carbon R56K Ω
R313	Carbon R220K Ω
R314	Carbon R220K Ω
R315	Carbon R10K Ω
R316	Carbon R10K Ω
R317	Carbon R1K Ω
R318	Carbon R1.5K Ω
R319	Carbon R68 Ω
R320	Carbon R820 Ω
R321	Carbon R1K Ω
R322	Carbon R100 Ω
R323	Carbon R68 Ω
R324	Carbon R1K Ω
R325	Metal Oxide R10 Ω /1W
R326	Carbon R68 Ω
R327	Carbon R10 Ω
R328	Carbon R1.2K
R329	Carbon R47K
R330	Carbon R2.7K
C101	Ceramic Condenser 33pf
C102	Ceramic Condenser 68pf
C103	Ceramic Condenser 100pf
C104	Ceramic Condenser 0.0047 μ f
C105	Ceramic Condenser 0.022 μ f
C106	Ceramic Condenser 22pf
C107	Ceramic Condenser 0.022 μ f
C108	Ceramic Condenser 0.022 μ f
C109	Ceramic Condenser 20pf
C110	Ceramic Condenser 0.001 μ f
C111	Ceramic Condenser 0.022 μ f
C112	Elyt Cap. 47 μ f/16WV
C113	Ceramic Cap. 0.022 μ f
C114	Ceramic Cap. 22pf
C115	Ceramic Cap. 220pf
C116	Elyt Cap. 10 μ f/16WV
C118	Ceramic Cap. 0.022 μ f
C119	Ceramic Cap. 0.01 μ f
C120	Ceramic Cap. 0.022 μ f
C121	Ceramic Cap. 0.022 μ f
C122	Ceramic Cap. 10pf CH
C123	Ceramic Cap. 0.1 μ f
C124	Ceramic Cap. 0.001 μ f
C125	Ceramic Cap. 0.001 μ f
C126	Mylar Cap. 0.0022 μ f
C127	Elyt Cap. 1 μ f/50WV
C128	Mylar Cap. 0.001 μ f
C129	Ceramic Cap. 0.022 μ f
C130	Ceramic Cap. 0.022 μ f
C131	Ceramic Cap. 0.022 μ f
C132	Ceramic Cap. 0.022 μ f
C201	Ceramic Cap. 0.047 μ f
C202	Ceramic Cap. 0.022 μ f
C203	Ceramic Cap. 120pf
C204	Ceramic Cap. 68pf
C205	Ceramic Cap. 100pf
C206	Ceramic Cap. 47pf

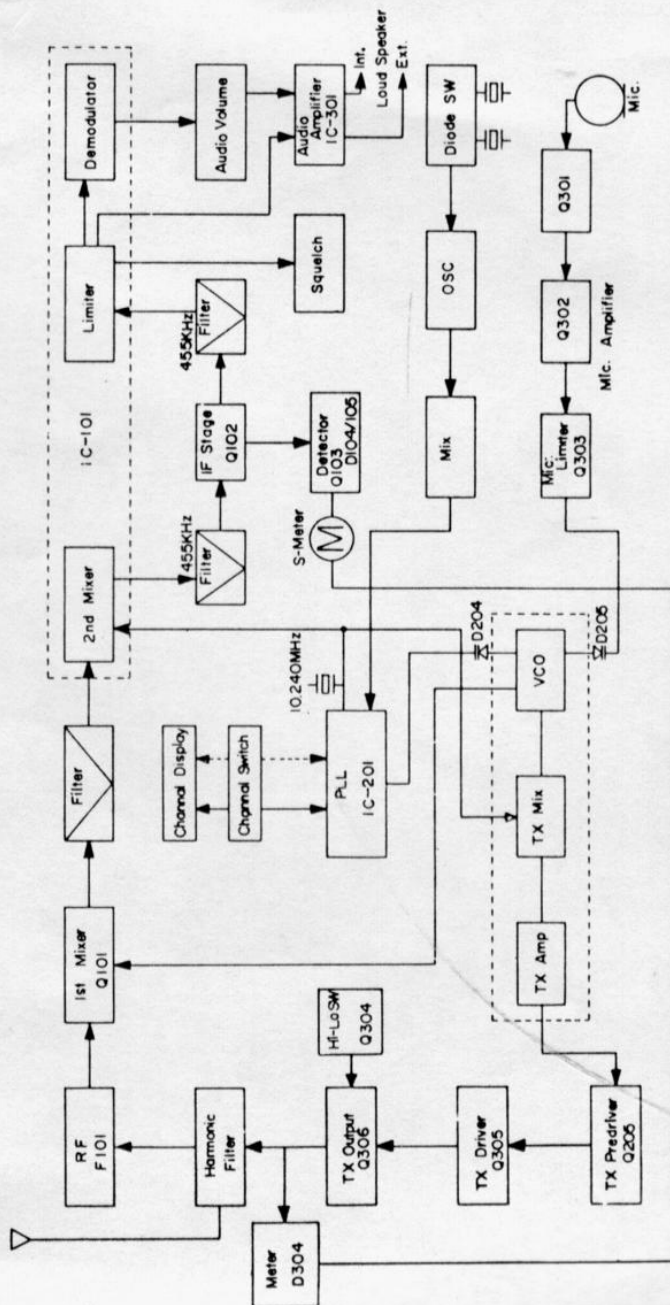
Symbol No.	Description
C207	Ceramic Cap. 5pf CH
C208	Elyt Cap. 4.7 μ f/50WV
C209	Ceramic Cap 0.01 μ f
C210	Ceramic Cap 22pf CH
C211	Ceramic Cap 39pf CH
C212	Ceramic Cap 33pf CH
C213	Ceramic Cap 330pf
C214	Ceramic Cap 33 pf
C215	Ceramic Cap 0.047 μ f
C216	Ceramic Cap 10pf CH
C217	Ceramic Cap 10pf CH
C218	Ceramic Cap 0.022 μ f
C219	Ceramic Cap 0.022 μ
C220	Ceramic Cap 0.01 μ f
C221	Ceramic Cap 270pf
C222	Ceramic Cap 120pf CH
C223	Ceramic Cap 0.022 μ f
C224	Creamic Cap 180pf
C225	Creamic Cap 0.01 μ f
C226	Creamic Cap 47pf
C227	Creamic Cap 0.01 μ f
C228	Creamic Cap 100pf
C229	Creamic Cap 150pf
C230	Creamic Cap 330pf
C231	Creamic Cap 100pf
C232	Creamic Cap 0.047 μ f
C233	Creamic Cap 0.022 μ f
C234	Elyt Cap 33 μ f/16WV
C235	Ceramic Cap 0.022 μ f
C236	Ceramic Cap 1pf CH
C237	Ceramic Cap 330pf
C238	Elyt Cap. 1 μ f/50WV
C239	Ceramic Cap 0.01 μ f
C240	Elyt Cap. 10 μ f/16WV
C241	Elyt Cap. 100 μ f/10WV
C301	Mylar Cap. 0.047 μ f
C302	Elyt Cap. 10 μ f/16WV
C303	Ceramic Cap. 330pf
C304	Elyt Cap. 1 μ f/50WV
C305	Mylar Cap. 0.022 μ f
C306	Elyt Cap. 10 μ f/16WV
C307	Ceramic Cap. 0.01 μ f
C308	Mylar Cap. 0.0022 μ f
C309	Mylar Cap. 0.01 μ f
C310	Elyt Cap 47 μ f/10WV
C311	Mylar Cap. 0.01 μ f
C312	Mylar Cap. 0.0022 μ f
C313	Ceramic Cap. 0.01 μ f
C315	Mylar Cap 0.1 μ f
C316	Elyt Cap 220 μ f/16WV
C317	Elyt Cap 47 μ f/10WV
C318	Mylar Cap 0.068 μ f
C319	Ceramic Cap 100pf
C320	Mylar Cap 0.068 μ f
C321	Elyt Cap 33 μ f/16WV
C322	Ceramic Cap. 68pf
C323	Ceramic Cap. 330pf
C324	Elyt Cap 4.7 μ f/16WV
C325	Mylar Cap 0.01 μ f
C326	Elyt Cap 1 μ f/50WV

Symbol No.	Description
C327	Ceramic Cap 1pf CH
C328	Ceramic Cap 0.022 μ f
C329	Ceramic Cap 0.01 μ f
C330	Ceramic Cap 100pf
C331	Ceramic Cap 0.022 μ f
C332	Ceramic Cap 100pf
C333	Ceramic Cap 220pf
C334	Elyt Cap 1000 μ f/16WV
C335	Ceramic Cap 330pf
C336	Ceramic Cap 0.0047 μ f
C337	Ceramic Cap 0.0047 μ f
C338	Ceramic Cap 0.0047 μ f
C339	Ceramic Cap 0.022 μ f
C340	Mica Cap 330pf
C341	Mica Cap 270pf
C342	Ceramic Cap 330pf
C343	Ceramic Cap 39pf
C344	Ceramic Cap 0.0047 μ f
C345	Ceramic Cap 0.0047 μ f
C346	Ceramic Cap 0.0047 μ f
C347	Mica Cap 220pf
C401	Ceramic Cap 0.022 μ f
C402	Ceramic Cap 0.022 μ f
C403	Ceramic Cap 0.022 μ f
C404	Ceramic Cap 0.022 μ f
	Front Bezel
	CH-Knob
	VR-Knob
	Front Chassis
	CH-Sel. Bracket
	Main Chassis
	Top Cabinet
	Bottom Cabinet
	Mounting Bracket
	Mounting Screw
	Front Name Plate
	LED Lamp Holder
	LED Filter
	Speaker Felt
	SW. Felt
	Mic. Hanger
	M.P.T. Name Plate
	Speaker Mounting Bracket
	Meter Cushion
	Rubber Washer
	Eye Let
	Owner Manual
	Styrol Foam
	Display Box
	Master Carton Box
	Poly Bag A
	Poly Bag B
	Poly Bag C
	Poly Bag D
	Silicagel
	Vinyl Tape
	P.P Band
	Band Clamper
	I.C. Heat Sink
	Tr. Heat Sink

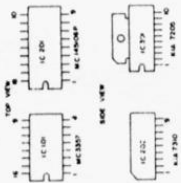
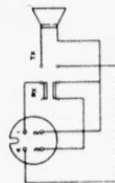
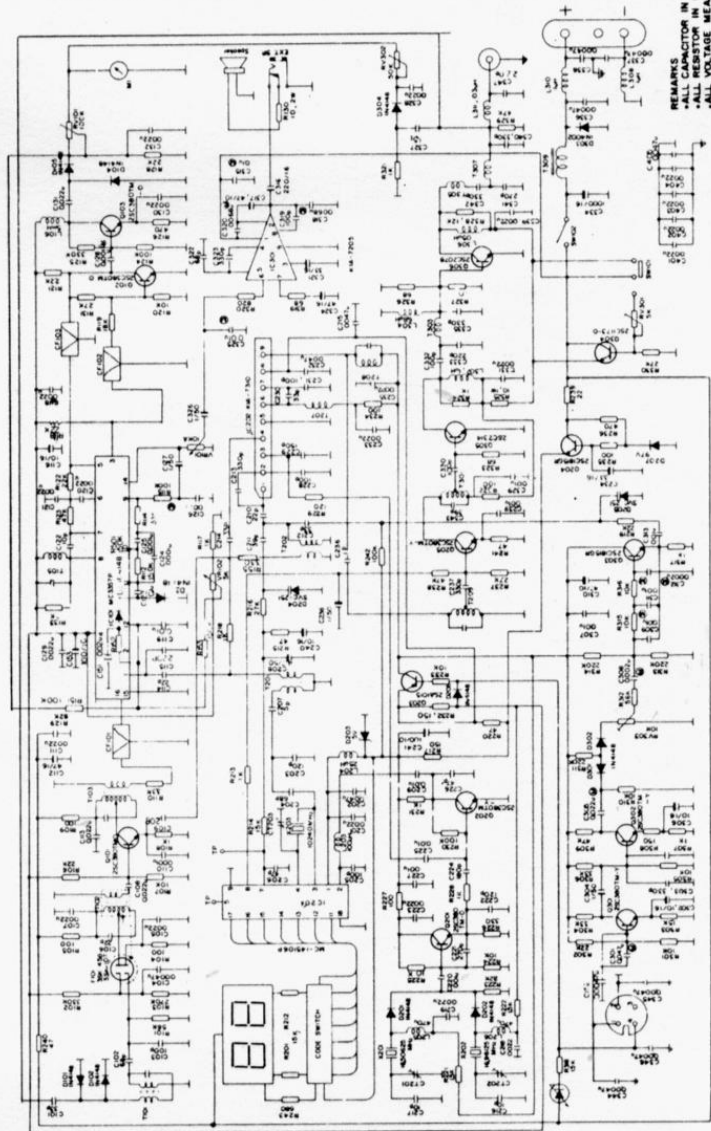
Symbol No.	Description
C405	Shield Plate A
	Shield Plate B
	Mica. Plate
	Cabinet Cushion
	I Cable Tag
	Pan Head Tapping Screw A
	Pan Head Tapping Screw B
	Pan Head Tapping Screw C
	Pan head Tapping Screw D
	Pan Head Tapping Screw E
	Pan Head Tapping Screw F
	Pan Head Screw A
	Pan Head Screw B
	Ceramic Cap 0.047 μ f

Symbol No.	Description
	Pan Head Screw C
	Pan Head Screw D
	Flat Head Screw
	Hex Nut
D401	Diode IS2473/IN4148
R151	Carbon R100K Ω
R152	Carbon R680K Ω
R153	Carbon R150K Ω
R155	Carbon R330 Ω
R501	Carbon R150K Ω
C151	Ceramic Cap. 0.02 μ f
C152	Ceramic Cap. 0.0047 μ f
C153	Elyt Cap100 μ f/10WV

BLOCK DIAGRAM



SCHEMATIC DIAGRAM



TOP VIEW

BOTTOM VIEW



SCHEMATIC DIAGRAM

REMARKS:
-ALL RESISTOR IN OHM
-ALL VOLTAGE MEASUREMENT AGAINST GROUND
-AT MIN VOLUME AND BOWELCH

