

This Information Is Provided By
CBTricks.com

Tram D64 Owner's Manual

Liability of damages to any equipment is the sole responsibility of the user! Downloading, viewing, or using any information provided on these pages automatically accepts the user to the terms of this agreement!

Modifications are provided for information purposes only!

Supporters of CBTricks.com paid for the hosting so you would have this file.

CBTricks.com is a non-commercial personal website was created to help promote the exchange of service, modification, technically oriented information, and historical information aimed at the Citizens Band, GMRS (CB "A" Band), MURS, Amateur Radios and RF Amps.

CBTricks.com is not sponsored by or connected to any Retailer, Radio, Antenna Manufacturer or Amp Manufacturer, or affiliated with any site links shown in the links database. The use of product or company names on my web site is not endorsement of that product or company.

The site is supported with donations from users, friends and selling of the Site Supporters DVD's to cover some of the costs of having this website on the Internet instead of relying on banner ads, pop-up ads, commercial links, etc. Thus I do not accept advertising banners or pop-up/pop-under advertising or other marketing/sales links or gimmicks on my website.

ALL the money from donations is used for CBTricks.com I didn't do all the work to make money (I have a day job). This work was not done for someone else to make money also, for example the ebay CD sellers.

All Trademarks, Logos, and Brand Names are the property of their respective owners.

This information is not provided by, or affiliated in any way with any radio or antenna Manufacturers.

Thank you for any support you can give.

For information on how to Support CBTricks.com

<http://www.cbtricks.com/support/>



SSB / AM



CITIZEN'S BAND TRANSCEIVER

TRAM/DIAMOND
CORPORATION

•
LOWER BAY ROAD
WINNISQUAM, N. H. 03289

TABLE OF CONTENTS

	Page
LIMITED WARRANTY	1
LICENSE AND REGULATION INFORMATION	2
GENERAL INFORMATION	3
OPERATION	5
CONTROL FUNCTION	5
Off-Vol	5
Squelch	5
Clarifier	5
Mode	6
Channel Selector	6
Noise Blanker	6
PA-CB Switch	6
Meter	6
SWR/Cal	6
SWR Alert Lamp	6
TX Lamp	6
Mic Jack	6
INITIAL OPERATION PROCEDURE	7
To Receive	7
To Transmit	7
USING THE TRAM D64 AS A BASE STATION	8
SPECIFICATION	8
GENERAL	8
TRANSMITTER	8
RECEIVER	9
REPLACEMENT PART LIST	10
SCHEMATIC DIAGRAM	17
BLOCK DIAGRAM	18
PLL BLOCK DIAGRAM	19

LIMITED WARRANTY

TRAM/DIAMOND CORPORATION, hereinafter referred to as TRAM, warrants that, for a period of ninety (90) days from the date of first sale to the original retail purchaser, this TRAM product will be free of defect in materials and workmanship. TRAM's obligation is limited to repairing or at TRAM's option, replacing those equipments or parts which are returned transportation and insurance prepaid, to the factory (or to the dealership where purchased without alteration or further damage and in TRAM's judgement, were originally defective or became defective in normal use.

This equipment designed under the direction of TRAM/DIAMOND CORPORATION and is manufactured for TRAM in Japan by one of the foremost makers of fine electronic products.

TRAM/DIAMOND CORPORATION, with pride, has added this product to its line of CB equipment.

LICENSE AND REGULATION INFORMATION

The Federal Communications Commission has made it possible for any citizen over eighteen (18) years of age to obtain a license to operate two-way radios in the Citizens Band. It is not legal to operate this equipment without a license.

Operation and equipment requirements are covered in Part 95 of the Federal Communications Commission's Rules and Regulations. Note the proper use of channel 9. This channel has been reserved for communications concerned with the immediate safety of life of individuals, the immediate protection of property or the emergency assistance to a motorist. No other use of this channel is authorized. All use of this equipment must conform to F.C.C. requirements. TRAM certifies that this equipment is designed and manufactured to fully comply with the F.C.C. technical requirements for Class D Citizens Radio Service operation.

To obtain your license, you must fill out the F.C.C. application form # 505. Read the application form carefully and fill it out, sign it and mail the application with the appropriate application fee to: FEDERAL COMMUNICATIONS COMMISSIONS, GETTYSBURG PENNSYLVANIA 17325. When approved the F.C.C. will issue your license. You will be assigned a number to be used as your station call letters.

Keep your license close to your equipment at all times. Fill out a transmitter identification card, F.C.C. form #452C and attach it to the radio. **DO NOT MAKE TRANSMISSIONS WITH YOUR EQUIPMENT UNLESS YOU HAVE YOUR LICENSE.** Read Part 95 of the F.C.C. Rules and Regulations thoroughly. Make your transmissions short and to the point. Listen to the channel before transmitting to see that it is not in use.

CAUTION: There are no user adjustable components in the D64 transmitter. Adjustments of the D64 transmitter or frequency determining circuits can only be done by, or under the immediate supervision of, the holder of a first or second class radio operator license.

GENERAL INFORMATION

The TRAM D64 is a compact mobile transceiver designed to provide 40 channel operation in either SSB or AM modes in the class "D" citizens band service. This versatile unit can also be used for public address paging and can be installed in either positive or negative ground systems.

The advanced solid state circuitry employs 42 transistors 62 diodes, 11 ICs and 5 FETs. The single conversion receiver uses a highly selective crystal filter in the SSB and AM mode.

The switch controlled RF noise blanker is very effective in reducing pulse or ignition type noise. A built-in rugged speaker, dynamic microphone and tamper deterrent mounting hardware complete this communications package of unusually high quality.

ANTENNA AND COAXIAL CABLE (Not provided)

The TRAM D64 is designed to work into a 50 ohm unbalanced antenna system. Many suitable antenna are commercially available ranging from full 1/4 wave length whips to base or top loaded antennas designed for cowl or roof top mounting.

The leading antennas are physically shorter and perform almost as well as the full whip. For those who want optimum results, a full 11 meter 1/4 wave whip is recommended.

Most of these antennas are designed for use with 52 ohm coaxial cable such as RG-58/U.

INSTALLATION

The TRAM Snap Bracket

TRAM now includes, with every set, its sensational and unique Snap Bracket (U.S. PAT. No. 4,042,201). This bracket provides a tremendous advantage to TRAM owners in achieving set removal and remount. Either operation requires only 10 to 12 seconds and, since the antenna connection is still the original coaxial connector and the power cord comes with a quick disconnect, the efficiency of the antenna system remains unchanged and the power cord connection is instant and positive.

Other than ordinary installation techniques there are, from our experience, two tips that should be of some value to you. Having decided on location, the top part of the bracket may, of course, be used as a layout template. To avoid distortion of the assembled bracket the two capscrews should not be tightened until the set is snapped into the lower part. The capscrews may be tightened with the radio at the desired angle. The capscrews are 1/4-28 Class 5, and are hard and durable and the Pem nuts, also being hard, allow considerable torque. A box wrench completely encircling the head of the capscrew will be found most satisfactory for supplying sufficient torque to maintain the angular adjustment.

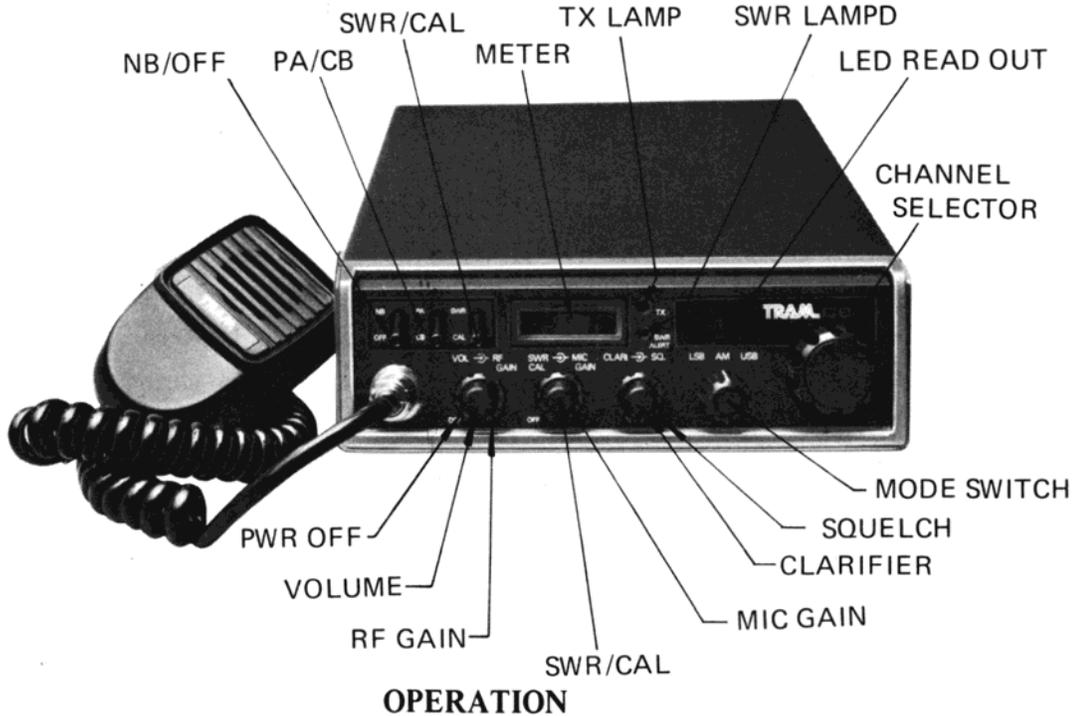
When installing the power cable supplied, it is necessary that the red wire be connected to the positive side of the vehicle's electrical system and the black wire be connected to the negative side of the system. Reversing these connection will cause the 3A line fuse to blow.

The case of the TRAM D64 will normally be grounded by either the antenna lead shield or the mounting bracket for both polarity systems.

If your system is negative (-) ground, ground the black power lead and connect the red lead to the electrical system.

If your system is positive (+) ground, ground the red lead and connect the black lead to the electrical system.

Connect the antenna cable to the coaxial connector on the rear panel of the unit using a matching PL-259 UHF connector.



A. Control Function

1. **OFF-VOL.** The volume control is combined with the DC power switch. At the extreme CCW (counter clockwise) position of the knob, the DC power to the unit is switched off. Advancing the control CW (clockwise) from this position turns on the power. To increase the loudness of the receiver audio, turn the control in a CW direction.
2. **SQUELCH.** This control, if turned CW, will quiet the receiver audio. If it is set just beyond the point where the receiver background noise disappears, any signal greater in strength than the noise level will restore the receiver to operation. The control may also be advanced to higher settings so that only relatively strong signals will open the squelch. This can be particularly useful if the band is open with skip signals that are weaker than the stations in your local area. The squelch can then be set to open only on the strong local signals.
3. **CLARIFIER.** Allows variation of the receiver operating below the assigned frequency. Satisfactory reception on SSB signals requires very careful tuning. Although this clarifier control is intended primarily to tune in SSB signals, it may be used to optimize AM signals.

4. **MODE.** The position of this switch determines what type of signal will be received and also what type of signal will be transmitted.
5. **CHANNEL SELECTOR.** The D64 is supplied equipped for 40 channel operation. The desired channel is selected by rotating the channel selector knob so that the number of the channel appears in the window. There is no stop on the switch so the knob can be continuously rotated in either direction allowing quick channel change.
6. **NOISE BLANKER.** The NB switch is used to turn the RF noise blanker ON and OFF in AM and SSB. It also switches the series gate ANL during AM operation.
7. **PA-CB SWITCH.** This switch is used for selecting normal CB communications or public address paging. In the PA position, it disables the transceiver and the internal speaker unit, and connects the audio amplifier output circuit to an external loud speaker unit (4 ohms – not supplied) for paging.
8. **Meter.** Indicates relative strength of received signals, transmitter output power and SWR.
strength. When transmitting, the meter reads output power in watts. the antenna cable and transceiver. After calibrating the meter, tune the antenna for minimum SWR with SWR/CAL switch in the SWR position.
9. **SWR/CAL.** The control is used in conjunction with the meter and SWR/ CAL switch to calibrate the transceiver for Standing Wave Ratio.
10. **SWR Alert Lamp.** Warns you that the antenna is mistuned or has become defective. The lamp will light at an SWR greater than 5:1.
11. **TX Lamp.** When the transmitter is keyed (on) in SSB or AM, this red lamp will glow at full brilliance.
12. **Mic Jack.** The microphone is connected to this jack. A matching four (4) pin connector is supplied attached to the microphone.

OPERATING PROCEDURE TO RECEIVE

1. Be sure that power source and antenna are connected to the proper connectors before going to the next step.
2. Place the CB/PA switch in the CB position and turn unit on by turning VOL control CW (clockwise).
3. Set the MODE switch to the desired mode. (LSB-AM-USB)
4. Set the CHANNEL selector switch to the desired channel.
5. Listen to the background noise from the speaker Turn the SQUELCH control slowly CW until the noise JUST disappears (no signal should be present). The SQUELCH is now properly adjusted. 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.
6. If there is static or ignition noise present, place the N/B-OFF switch in the NB position.
7. Adjust the CLARIFIER control to clarify the SSB or to optimize AM signals.

OPERATING PROCEDURE TO TRANSMIT

CAUTION: Be sure that the antenna is properly connected to the unit before attempting to transmit. Transmitting without an antenna or into a poor or broken antenna with a high SWR (5:1 or over) can cause permanent damage to the transmitter.

1. Select the desired channel.
2. Rotate the Mic Gain control clockwise to its 12:00 position.
3. If the channel is clear, push the press-to-talk switch on the microphone and speak in a normal voice. The red lamp will light and the output meter will indicate transmitter power out.
4. Release the push-to-talk switch to receive.
5. Reading SWR.

USING THE TRAM D64 AS A BASE STATION

The TRAM D64 makes excellent base station equipment. All that is necessary to operate yours at your base is a regulated power supply to convert the 120V AC house current to approximately 13.8V DC.

You may purchase such a power supply locally from your CB dealer.

SPECIFICATIONS

General

Channels	40 channels
Frequency Range	26.965 to 27.405 MHz
Frequency Control	Digitally synthesized PLL
Frequency Tolerance	0.005%
Operating Temperature Range	-30°C to +50°C
Humidity	95%
Microphone	Dynamic w/Push-to-talk switch and coiled cord
Supply Voltage	13.8V DC positive or negative ground. 15.9V DC maximum, 11.7V DC minimum
Current Drain	Transmit: AM 95% mod. carrier 2 amps. SSB 12 watts PEP output 2.5 amps. Receive: Squelched 0.35 amps 2 watts audio output 0.8A
Size	2.3"(H) × 7.4"(W) × 10.6"(D).
Weight	Approximately 4-1/2 pound

Transmitter

Power Input	AM: 6 watts SSB: 25 watts
Power Output	AM: 4 watts SSB: 12 watts
Modulation Capability	100%
Infermodulation Distortion	SSB: 3rd order -25db 5th order -35db
Carrier Suppression	SSB: -40db
Unwanted Sideband	-50db
Frequency Response	AM & SSB: 350-2500 Hz
Output Impedance	50 ohms, unbalanced

SSB filter 7.8 MHz, crystal lattice type
6db @4.0Khz
50db @5.5Khz

Receiver

Sensitivity SSB: 0.5 μ V for 10db S+N/N
AM: 1 μ V for 10db S+N/N

Selectivity SSB: 6db @2.4Khz, 50db @5.5Khz
AM: 6db @ \pm 2Khz, 50db @5.5Khz

Image Rejection 50db

IF Frequency 7.8MHz

AGC (Automatic Gain Control) Less than 10db increase in audio output for
input of 1 to 500,000 μ V

Squelch Adjustable. Threshold less than 1 μ V

Noise Limiter Series gate type

Clarifier Range \pm 700Hz minimum

Audio Output Power 4.0 watts with 10% THD into a 4 ohms load

Hum & Noise -40db

REPLACEMENT PARTS LIST

CAPACITORS

Schematic symbols	Description
C318, C319, C320, C337, C410, C412, C413, C414, C613, C922, C924	Ceramic 0.001 μ F
C101, C107, C108, C109, C110, C111, C112, C113, C201, C203, C205, C217, C218, C220, C225, C215, C233, C237, C240, C241, C242, C303, C305, C306, C307, C308, C309, C310, C312, C313, C317, C321, C322, C324, C326, C328, C329, C332, C334, C336, C403, C404, C405, C406, C408, C409, C411, C416, C419, C420, C508, C511, C517, C602, C603, C604, C611, C614, C616, C617, C704, C705, C706, C707, C712, C713, C716, C717, C719, C723, C724, C725, C729, C732, C744, C747, C748, C751, C752, C754, C757, C802, C803, C804, C805, C806, C807, C808, C809, C810, C903, C912, C913, C927, C928, C934, C938	Ceramic 0.01 μ F
C901, C933, C935, C936	Ceramic 0.047 μ F
C606	Ceramic UJ 20pF
C929	Ceramic UJ 22pF
C907	Ceramic UJ 30pF
C918	Mica 1pF
C749, C750	Mica 1.5pF
C756	Mica 3pF
C314, C510, C514, C709, C911, C920	Mica 5pF
C915	Mica 4pF
C610, C745	Mica 10pF
C301, C315, C316, C737, C738, C417, C916, C917	Mica 15pF

Schematic symbols	Description
C335, C702, C914	Mica 20pF
C740	Mica 24pF
C919	Mica 27pF
C402, C407, C515, C701, C720, C753, C932	Mica 30pF
C302, C401, C730	Mica 33pF
C741	Mica 35pF
C333, C755	Mica 47pF
C418, C711, C718, C755, C906, C925	Mica 56pF
C726	Mica 65pF
C708, C710	Mica 68pF
C703, C721, C731, C743, C746, C908, C921, C923	Mica 100pF
C931	Mica 120pF
C714	Mica 130pF
C609	Mica 150pF
C330, C507	Mica 160pF
C727	Mica 170pF
C742	Mica 200pF
C739	Mica 220pF
C715	Mica 270pF
C930	Mica 330pF
C734, C735	Mica 400pF
C608	Mica 510pF
C206, C224, C230	Mylar-film 0.01 μ F
C228, C229	Mylar-film 0.02 μ F
C102, C103, C323, C327, C331, C518, C601, C612, C615, C733, C801	Mylar-film 0.04 μ F
C214, C236, C513	Mylar-film 0.1 μ F
C235	Mylar-film 0.2 μ F
C311, C910	Gimic 1pF
C211, C503	Electrolytic 0.22 μ F
C202, C210, C213, C216, C221, C222, C227, C304, C338, C506, C512	Electrolytic 1 μ F
C208	Electrolytic 3.3 μ F
C239, C415, C504	Electrolytic 4.7 μ F
C223, C226, C722, C728, C758	Electrolytic 10 μ F

Schematic symbols	Description
C515	Electrolytic 33 μ F
C207, C234, C516	Electrolytic 47 μ F
C209	Electrolytic 100 μ F
C105, C106, C238, C902	Electrolytic 220 μ F
C104	Electrolytic 2200 μ F
C905	Tantalum 0.22 μ F
C904	Tantalum 1 μ F
C219	Tantalum 10 μ F
C232	Tantalum 22 μ F
C937	Aluminum 0.1 μ F

RESISTORS

R709	5.6 ohms
R522, R516, R708	10 ohms
R313	22 ohms
R702, R711, R901, R914	56 ohms
R210, R414	100 ohms
R204, R216, R308, R318, R322, R218, R323, R403, R527, R610, R619, R312	220 ohms
R911, R614	150 ohms
R621, R908	330 ohms
R301, R305, R306, R316, R319, R307, R402, R405, R606, R902, R912	470 ohms
R713	390 ohms
R101, R210, R730, R915	560 ohms
R309, R310, R620, R727	1.5K ohms
R108, R223, R227, R228, R229, R304, R205, R311, R327, R411, R525, R607, R406, R617, R710, R720, R733, R734, R903, R916, R918, R924, R913	1K ohms
R206, R212, R409, R618, R328	2.2K ohms
R705	2.7K ohms
R220, R226, R601, R602, R603, R624, R719, R725, R909	3.3K ohms

Schematic symbols	Description
R215, R221, R222, R225, R317, R530, R604, R623, R704, R731, R502, R906, R109	4.7K ohms
R401	5.1K ohms
R104, R719	5.6K ohms
R107, R213, R320, R529, R920	6.8K ohms
R105	8.2K ohms
R321, R412, R413, R506, R510, R512, R514, R521, R526, R605, R608, R609, R710, R721, R907, R923, R324, R325, R410	10K ohms
R302	12K ohms
R224, R910	15K ohms
R732	18K ohms
R219, R515, R921	22K ohms
R520, R523, R524, R722, R922, R315	33K ohms
R326	39K ohms
R329, R404, R415, R513, R919, R729	47K ohms
R615	56K ohms
R202, R303, R407, R501, R613, R703, R110	100K ohms
R211, R612, R503	220K ohms
R513	470K ohms
R408	1M ohms
R905	Solid type 10K ohms 1/8 watt
R904	Solid type 47K ohms 1/8 watt
R712	Solid type 2.2 ohms 1/2 watt
R718	Solid type 5.6 ohms 1/2 watt
R717	Solid type 22 ohms 1/2 watt
R714	Solid type 39 ohms 1/2 watt
R715	Solid type 330 ohms 1/2 watt
R217, R518	Semi-fixed 1K ohms 2T
R517	Semi-fixed 5K ohms 2T
R723	Semi-fixed 500 ohms 2T
R103, R507	Semi-fixed 10K ohms 2T
R611, R728	Semi-fixed 10K ohms 3T
R106	Semi-fixed 20K ohms 2T
R207	Semi-fixed 50K ohms 2T

Schematic symbols	Seacription
R616, R726	Semi-fixed 100K ohms 2T
R716	Metaloxide film 100 ohms 2 watt
R102	Metaloxide film 150 ohms 2 watt
Q204	2SC1061
Q704	2SC1306 or 2SC2092
Q705	2SC1969H
Q703	2SC1449
Q702	JSP7001B
Q601, Q602, Q603	JA1350
Q302	2SK19GR
Q201	2SK30Y
Q502	2SK34W
Q405	2SK41F
Q301	3SK41L
CR101	U05B
CR102, CR105, CR106	10D1
CR104	BZ100
CR301, CR302	MI301
CR103, CR107, CR108, CR201, CR202, CR204, CR205, CR206, CR207, CR208, CR209, CR401, CR501, CR502, CR503, CR501, CR511, CR512, CR601, CR602, CR603, CR604, CR605, CR607, CR704, CR705, CR706, CR903	IN4448
CR303, CR304, CR402, CR403, CR504, CR505, CR507, CR509, CR513, CR506, CR707, CR708, CR709, CR710, CR711	IN60
CR404, CR405, CR405, CR508	IN34A
CR701, CR702, CR703	IS990A
CR902	IS2688
CR901	MV201

COILS, CHOKES AND TRANSFORMERS

L101	AF choke K-18
L201, L404	AF choke K-69
L303, L304, L403, L713	Microinductor 22 μ H

Schematic symbols	Description
L903	Microinductor 2.2 μ H
L701, L902	Microinductor 3.3 μ H
L707	Microinductor 1.2 μ H
L708, L710, L711	RF choke 0.22 μ H
L703, L705	RF choke 0.65 μ H
L712	RF choke 0.4 μ H
L301	RF Transformer C366Z
L302	RF Transformer Y576Q
L401	RF Transformer Z542R
L402	RF Transformer C544N
L601	RF Transformer Y576Q
L702	RF Transformer C042Z
L704	RF coil C979N
L706	RF coil C996N
L709	RF coil C043N
L901	RF Transformer Z368N
L904	RF Transformer Y388N
L905	RF Transformer Y369N
T201	AF Transformer L71
T301, T302	RF Transformer C193I
T303, T304, T305, T306	IF Transformer S183A
T307	IF Transformer S190A
T401, T402	RF Transformer Z561D
T403	RF Transformer S518A
T701, T702	RF Transformer C577D
T703	Troidal Z898NZ

CRYSTALS AND FILTER

Y601	7.8015MHz
Y901	10.000MHz
FL301	7.8MHz crystal filter

IC's

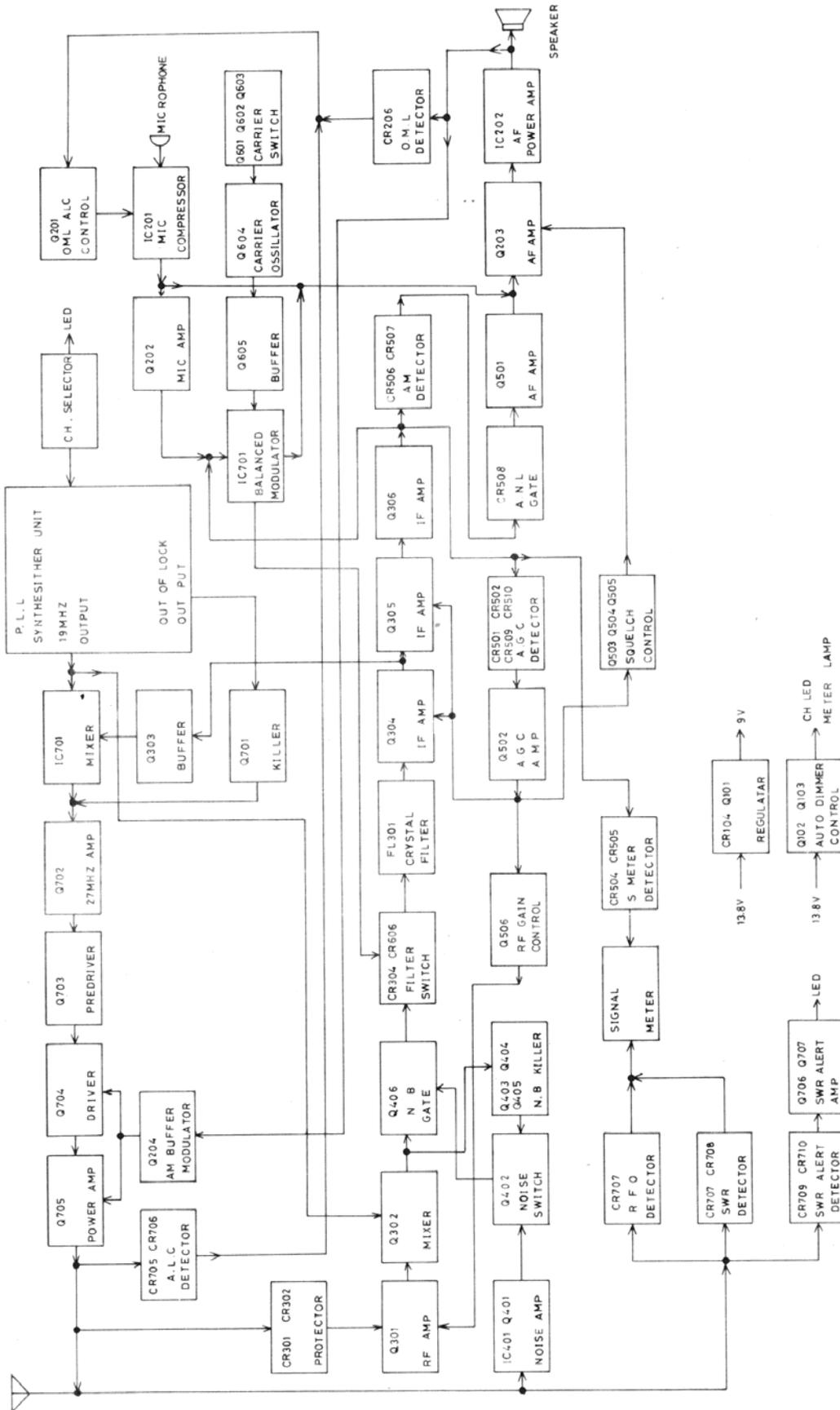
IC201	MC3340
IC202	HA1366WR

Schematic symbols	Description
IC401	MC1350P
IC601	μ PC1037H
IC701, IC902	TA7310P
IC901	78L62WV
IC903	NDC40013

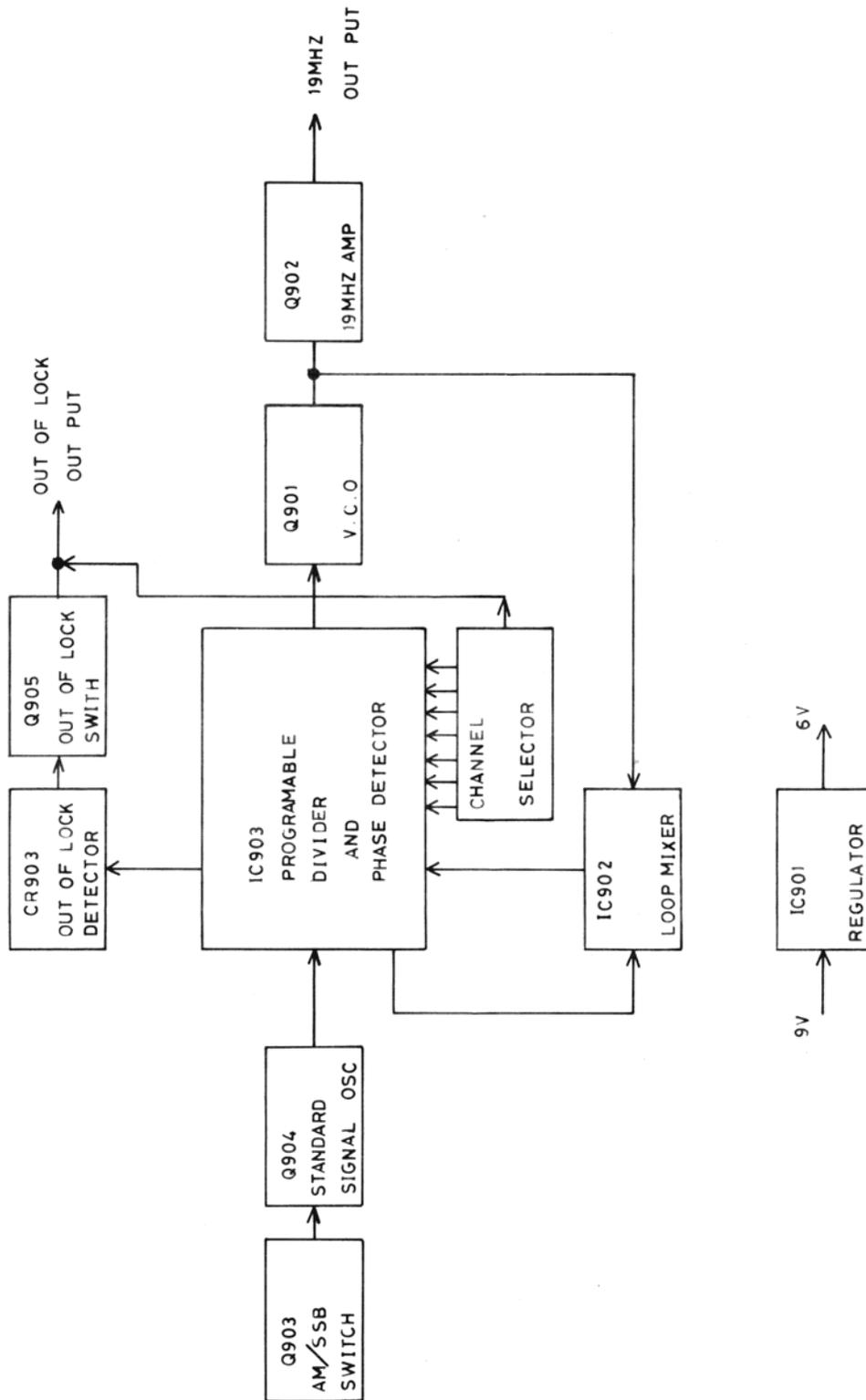
TRANSISTORS AND FET's

Q707, Q905	2SA844C
Q102, Q202, Q203, Q501	2SC372Y
Q303, Q304, Q305, Q306, W401, Q402, Q403, Q404, Q406, Q503, Q504, Q505, Q604, Q605, Q706, Q901, Q902, Q904	2SC710C
Q506, Q701, Q903	2SC711F
Q101, Q103	2SC1014D

BLOCK DIAGRAM



PLL BLOCK DIAGRAM



IMPORTANT NOTICE

To ensure continued compliance to F.C.C. technical requirements, service requiring adjustments to the transmitter portion of this transceiver must be performed only by persons holding commercial first or second class radio telephone operator licenses.

F.C.C. Type Acceptance data and Receiver Certification data is on file at the Federal Communications Commission, listed as F.C.C. data "TRAM D-64".