Tram XL Owner's Manual

TRAM XL

CITIZEN'S BAND TRANSCEIVER

A PRODUCT OF
TRAM / DIAMOND
CORPORATION

●

LOWER BAY ROAD
WINNISQUAM. N. H. 03289

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 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 the dealership where purchased) without alteration or further damage and in Tram's judgment, were originally defective or became defective in normal use.

This equipment was designed under the direction of Tram/Diamond Corporation and is manufactured for Tram/Diamond in Japan by one of the world's foremost makers of fine electronic products.

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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 Citizen's Band. It is not legal to operate this equipment without a license.

Operating and equipment requirements are covered in Part 95 of the Federal Communications Commission's Rules and Regulations. Note the proper use of channel 9 (27.065 MHz). 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/ Diamond Corporation 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. It is listed with the F.C.C. as Type Number "TRAM XL".

To obtain your license, you must first fill out the F.C.C. application form #505. Read the application form carefully and fill out the work sheet, transfer this information to the application from, sign and mail the application with application fee to: FEDERAL COMMUNICATIONS COMMISSION, 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 #452-C and attach it to the side of the two-way 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.

GENERAL INFORMATION

The TRAM XL is a compact mobile transceiver designed to provide 23 channel AM operation in the class "D" citizen's band service. This versatile unit can also be used for public address paging and can be installed in either positive or negative ground battery systems.

The advanced solid state circuitry employs 21 transistors, 15 diodes and an audio compression circuit to maintain nearly 100% modulation. The double conversion receiver uses a highly selective ceramic filter to provide excellent adjacent channel rejection. The switch controlled automatic noise limiter is very effective in reducing pulse or ignition type noises. A rugged built-in speaker, dynamic microphone and tamper deterrant mounting hardware are also features of this communications package of unusually high quality.

ANTENNA AND COAXIAL CABLE (not provided)

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

INSTALLATION

Having decided where to mount the TRAM XL, position the unit and bracket in place, see that it does not interfere with the vehicle's controls and that all of the TRAM XL controls are easily accessible.

Mark the bracket location carefully and use the bracket as a drilling template for the mounting holes.

Note: The screws provided for attaching the radio to the mounting bracket have a hex socket heads and require the use of the allen wrench, also provided. These screws are virtually tamper proof and will discourage theft. We recommend using round headed screws for attaching the mounting bracket under the car dash. Usually there will not be room for a thief to remove these screws using standard tools.

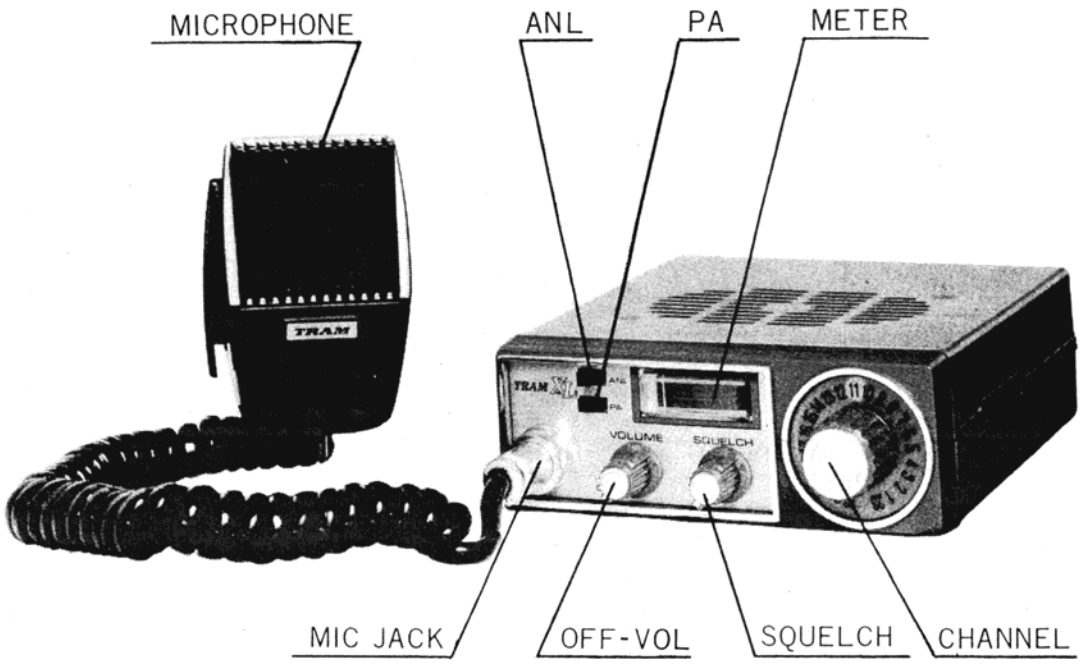
When installing the power cable supplied, it is necessary that the red wire be connected to the positive side of the vehicle's electrical system and the black wire be connected to the negative side of the system. Reversing these connections will cause the 2A line fuse to blow.

The case of the TRAM XL 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.

Connect the microphone plug to the microphone jack located on the front panel.



OPERATION

A. Control Function

1. **OFF-VOL.** The volume control is combined with the DC power on-off 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. **CHANNEL SELECTOR.** The TRAM XL is supplied equipped for 23 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.

4. **NOISE LIMITER.** The ANL switch is used to turn the ANL circuit ON and OFF. Normally, when driving, or if stopped in traffic, it would be advisable to have the ANL switch in the ANL position because of the strong ignition noises present. If, however, you are stopped on a quiet road, turning the ANL switch OFF (left hand position) may improve very weak signal reception.

5. **PA SWITCH.** This switch is used for selecting normal CB communications, or public address paging. In the PA position, it disables the transcever and the internal speaker unit and connects the audio amplifier output circuit to an external speaker (4 or 8 ohms - not supplied) for paging. During PA operation, the "S" meter is not illuminated. Note also, during PA operation, the internal speaker will be operative unless an external paging speaker is connected.

6. **METER.** Indicates signal strength of received signal in S units and relative transmitter power output.

7. **MIC JACK.** The microphone is connected to this jack. A matching four (4) pin connector is supplied attached to the microphone.

Before any attempt is made to operate the TRAM XL, be sure that the proper power and antenna connections are made as indicated in the installation sequence on pages 2 and 3.

B. Operating Procedure to Receive

1. The PA switch should be in the left hand position.
2. Turn the power on to the set by turning the ON-OFF volume control CW. Adjust volume control to a comfortable listening level.
3. Turn the channel selector to the desired channel.
4. While listening to background noise (wait until the channel is clear if signals are present),adjust the SQUELCH until the background noise JUST disappears. The Receiver will remain quiet until a signal is received that is greater in strength than the background noise. Be careful not to advance the SQUELCH farther than is necessary to quiet the background noise, as weak signals may not be heard.

C. Operating Procedure to Transmit

1. Select the desired channel.
2. If the channel is clear, push the press-to-talk switch on the microphone, making sure the button is fully depressed, hold the microphone close to, but to the side of, your mouth and speak in a normal voice.

D. USING THE TRAM XL AS A BASE STATION

The TRAM XL 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 or from TRAM/DIAMOND Corporation as an optional accessory.

SPECIFICATIONS

GENERAL

Channels	23.
Frequency Range	26.965 to 27.255 MHz.
Frequency Tolerance	0.005%.
Operating Temperature Range	−30°C to +50°C.
Microphone	Dynamic with push-to-talk switch and coiled cord.
Supply Voltage	13.8V DC (positive or negative ground)
Current Drain	Receive: 1.3A @ maximum audio output. 0.30A standby (no signal). Transmit: Full mod - - - - - - 1.8A
Meter	Illuminated, indicates receiving signal strength and relative power output
Size	1.97" (h) ×5.5" (w) ×6.3" (d).
Weight	2.5 pounds.

TRANSMITTER

Full Carrier	4.0 watts.
Modulation Capability	100%.
Harmonic Suppression and Spurious Emissions	Better than FCC requirement.
Frequency Response	300 to 3000 Hz.

RECEIVER

Sensitivity	.6μV for 10dB S+N/N, signal mod. 30% @1kHz sine wave.
Selectivity	6dB @ 4kHz, 60dB @ 20kHz
AGC	Change in audio output less than 12dB from 10μV to .5volts.
Squelch	Adjustable. Threshold less than .5μV. Tight more than 100μV.

Audio Frequency Response 300 to 3000Hz.

Distortion	Less than 10% at 3.0 watts output.
Image Rejection	More than 50dB.
IF Rejection	More than 80dB at 455kHz, 60dB @7.8 MHz.
Adjacent Channel Rejection	More than 55dB @.6μV.
Cross Modulation	More than 55dB.
IF Frequency	7.8 MHz & 455kHz.
Noise Limiter	Series gate ANL.

REPLACEMENT PARTS LIST

NOTE: UNLESS OTHERWISE MARKED.

CAPACITORS

All ceramic capacitors are ± 10%, 50V DC.
All mylar-film capacitors are ± 20%, 50V DC.
All electrolytic capacitors are + 100%, −10%, 50V DC.

Schematic symbol	Description		Stock No.
C11,15,39,40	Ceramic SL 1pF		260-36-023
C49,54,55	Ceramic SL 2pF		260-36-002
C3	Ceramic SL 5pF		260-36-004
C36	Ceramic SL 6pF		260-36-051
C5,18,35	Ceramic SL 10pF		260-36-030
C7	Ceramic N220 15pF		260-36-048
C41,51	Ceramic SL 22pF		260-36-005
C10	Ceramic N220 22pF		260-36-049
C12	Ceramic N220 33pF		260-36-024
C95	Ceramic SL 47pF		260-36-021
C52	Ceramic SL 68pF		260-36-011
C1,6,30,34,44,47	Ceramic SL 100pF		260-36-006
C29,37	Ceramic SL 150pF		260-36-025
C4	Ceramic SL 180pF		260-36-042
C2,33,43,46,60	Ceramic SL 220pF		260-36-029
C68	Ceramic Y5R 470pF		260-34-022
C73	Ceramic Y5R 1000pF		260-34-024
C8,13,14,21,38,45,48,50,53,56,57,61,63,64,65,66,69,72,74,77,81,83,84,85,86,87,89,91,92,97,98	Ceramic Y5R 4700pF		260-34-021
C25,31,32,96	Mylar-film	0.01μF	260-37-005
C27	Mylar-film	0.015μF	260-37-008
C17,19,20,22,23,28,67	Mylar-film	0.033μF	260-37-001
C9,62,70,75	Electrolytic	1μF	260-43-027
C16,26	Electrolytic	3.3μF	260-43-028
C90,93	Electrolytic	10μ 16V	260-43-030
C94	Electrolytic	47μ 16V	260-43-048
C24	Electrolytic	100μ 10V	260-43-036
C71	Electroltic	220μ 16V	260-43-046
C80	Electrolytic	220μ 25V	260-43-045

RESISTORS

All resistors are 1/4 Watt, 10% carbon fixed.

R77	0.5Ω	260-54-035
R49	1Ω	260-54-034
R84	4.7Ω	260-54-090

Schematic symdol	Description	Stock No.
R81	10Ω	260-54-087
R50,59	22Ω	260-54-054
R63	47Ω	260-54-055
R74	68Ω	260-54-057
R26,29,31,38,43,48	100Ω	260-54-048
R6,7,11,37,42,57,73	220Ω	260-54-042
R33	470Ω	260-54-098
R15,46	470Ω	260-54-065
R5,27,30,44,82,86	1kΩ	260-54-060
R39,89	1kΩ	260-54-095
R55	1.5kΩ	260-54-092
R34,71	2.2kΩ	260-54-068
R52	2.7kΩ	260-54-069
R10,12,75,76	3.3kΩ	260-54-070
R2,4,14,22,58,60,65,88	4.7kΩ	260-54-071
R9,67	10kΩ	260-54-074
R24,35	15kΩ	260-54-075
R68,80	22kΩ	260-54-076
R20,21	33kΩ	260-54-077
R18,19,45,64,66,87	47kΩ	260-54-078
R16,47	68kΩ	260-54-079
R8,13,61,72	100kΩ	260-54-080
R25,28,32,36,41	220kΩ	260-54-082
R23,62	470kΩ	260-54-084
R70	1MΩ	260-54-091
R40,56	Solid 220Ω 1/2w	260-56-016
R85	Solid 390Ω 1/4w	260-56-021
R1	Solid 1kΩ 1/2w	260-56-010
R79	Metal fixed 10Ω 1w	260-50-002
R78	Metal fixed 4.7Ω 2w	260-50-001
R51	Semi fixed(Pot.) 5kΩ	260-61-089
R17	Semi fixed(Pot.) 50kΩ	260-61-078
R3	Semi fixed(Pot.) 100kΩ	260-61-090
R54	Variable 5kΩ	260-61-085
R69	Variable 50kΩ with 2C-2P	260-61-086
R53	Thermistor D33A	260-69-002

COILS, CHOKES AND TRANSFORMERS

T1,L4	RF transformer L2038	260-25-076
T2	RF transformer L1786	260-25-042
T3	RF transformer L1788	260-25-047
T4	IF transformer DI0766	260-27-016
T5	IF transformer DI0753	260-27-008
T6	RF transformer L2063	260-25-077
T7,8	RF transformer L1784	260-25-049
T9	RF transformer L2064	260-25-078

Schematic symbol	Description	stock No.
T10,11,12	R F transformer L2104	260-25-080
T13	AF driver transfomer	260-22-010
T14	AF output transformer	260-23-016
L1,2	RF coil L1904	260-25-071
L3	RF coil L1793	260-25-051
L5	RF coil L 2066	260-25-074
L6	RF choke coil L2067	260-25-075
L7	AF choke coil	260-25-073

DIODES AND TRANSISTORS

CD1,2,3,4,5,6,8,14,16	1S1588	A72-49-600
CD7	02Z8.2A	A72-86-700
CD9	M8513A-R	A73-16-179
CD10,11,12,13	1S1885	A75-68-500
CD15	1S2093	A72-83-300
Q1	2SC784-R	A67-37-940
Q2,3,4,5,6,7,8,9,14,15	2SC372-Y	A67-07-244
Q10	2SC387A	A67-08-760
Q11	2SC1166-Y	A67-70-960
Q12	2SC482-GR	A67-15-280
Q13	2SC1237	A67-76-200
Q16,17	2SC733-Y	A67-33-340
Q18	2SC735-0	A67-33-540
Q19,20	2SD235-Y	A68-23-560
Q21	2SA562-0	A65-09-220

CONNECTORS AND SWITCHS

J1	Antenna jack S0239	260-16-024
J2	Microphone jack	260-16-044
J3,4	SP jack	260-16-013
P1	Microphone plug	260-16-045
P2	Connector for power cord	260-16-051
S1,3	Slide switch 4C-2P	260-14-069
S2	Rotary switch 24 steps	260-14-071
F1	Fuse 2A	260-14-024
FS1	Fuse holder	260-16-048
K1	Relay 1C-2P	260-14-070
M1	DC ammeter 200μA	260-19-016
MK1	Dynamic microphone	260-15-092
PL2	Indicator lamp	260-11-010
SP1	Speaker	260-15-280
U1	Ceramic filtcr	260-19-007
X1	Crystal 11.705MHz	260-15-264
X2	Crystal 11.755MHz	260-15-265

Schematic symbol	Description	Stock No.
X3	Crystal 11.805MHz	260-15-266
X4	Crystal 11.855MHz	260-15-267
X5	Crystal 11.905MHz	260-15-268
X6	Crystal 11.955MHz	260-15-269
X7	Crystal 7.460 MHz	260-15-270
X8	Crystal 7.470 MHz	260-15-271
X9	Crystal 7.480 MHz	260-15-272
X10	Crystal 7.500 MHz	260-15-273
X11	Crystal 7.345 MHz	260-15-274
X12	Crystal 7.800 MHz	260-15-275
W1	DC power cord	260-17-007
	Knob for CH SW	260-86-059
	Knob for Vol, SQ	260-86-060
	Dial(CH Ind.)	260-82-004

IMPORTANT NOTICE

To insure continued compliance to FCC 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 operator licenses.

Replacement crystals should be ordered from Tram/Diamond Corporation in order that proper transmitter output frequency tolerances be maintained.

FCC Type Acceptance data is on file at the Federal Communications Commission, listed as FCC Type Number "TRAM XL".