

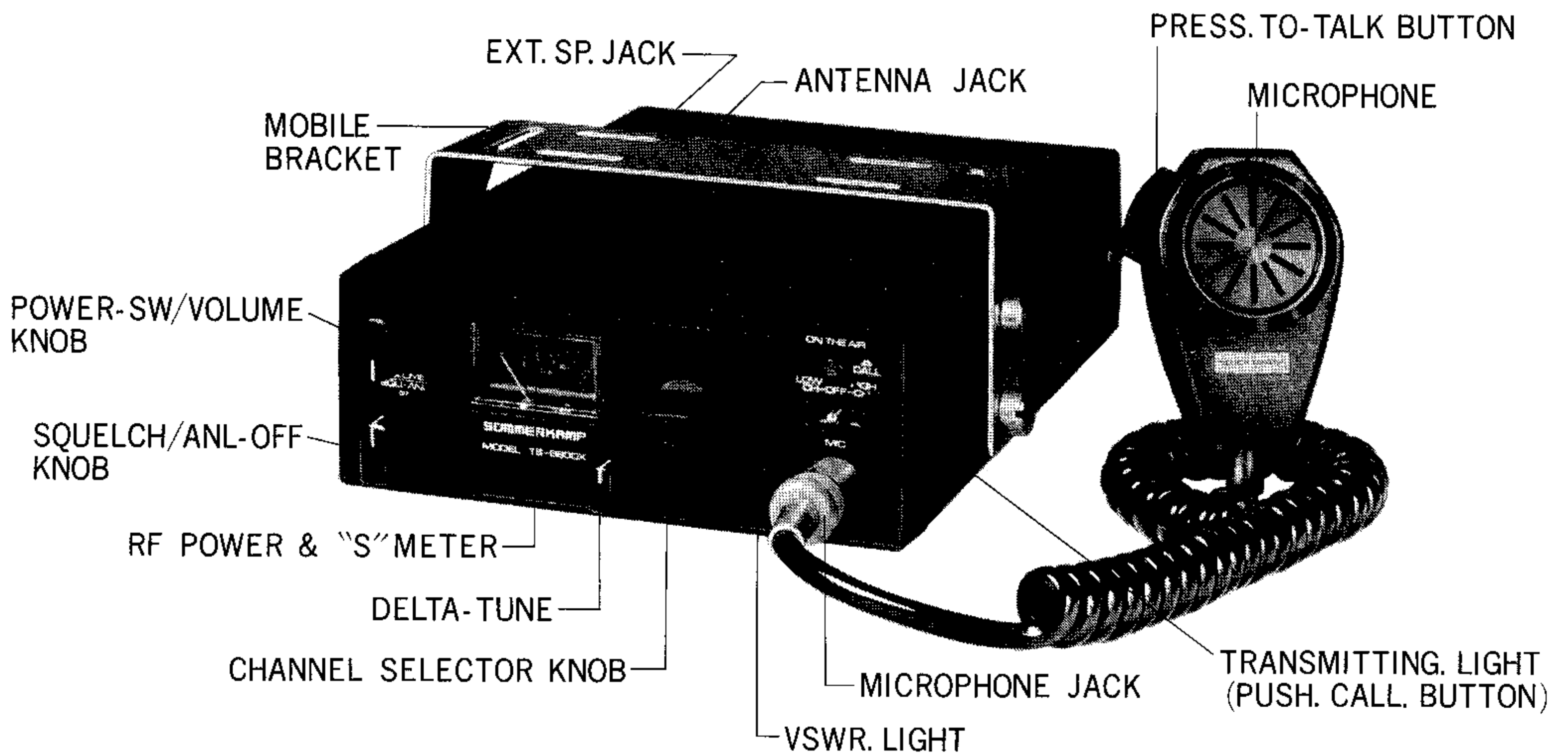
# SOMMERKAMP<sup>®</sup>

## CITIZENS BAND TRANSCEIVER INSTRUCTION MANUAL



MODEL: TS-680DX

## CONTROL LOCATIONS:



## PACKING LIST

Beside this manual, the carton shall contain the following items:

1. Transceiver TS-680DX
1. Mounting bracket.
4. Screw for Mounting bracket.
1. Microphone hanger.
1. Microphone.

## **GENERAL DESCRIPTION**

Your SOMMERKAMP TS-680DX transceiver has been designed for continuous heavy duty mobile and base station application.

It can be operated with a microphone and internal speaker or handset, speaker/microphone combination, telephoneset incorporating automatic voice operated transmit/receive switching, external selective calling with automatic answer-back and many more.

## **GENERAL**

The transceiver is designed to operate from 13.8 Volt DC powersupply as a base or mobile station. It's straight forward 80 channel capability allows it to operate on any channel within 26.965 and 27.755 MHz.

## **RECEIVER SECTION**

The receiver section is designed to receive amplitude modulated (AM/A3) signals in the 26.965 to 27.755 MHz. (11 meter) citizens band .

The unique combination of low noise Field Effect Transistor (FET), double conversion, a combination of mechanical ceramic, and L/C filters, fully automatic noise limiter (ANL) and a hifi quality speaker amplifier will give you exceptional reception quality in this fine piece of equipment.

In addition, the above combination of the latest technology provides you with a sensitivity and unwanted signal rejection and noise suppression available previously only in space and military communication equipment.

The power supply of the receiver RF, IF, and oscillator section is stabilized by an extreme sharp cut-off Zener diode to obtain the high sensitivity and unwanted signal rejection. The fully automatic series gate noise limiter, which virtually cuts off the audio output during ignition noise pulses, is defeatable to make even the weakest signal audible which otherwise would be cut off by the threshold level of the ANL switching diode.

The high squelch sensitivity is achieved by using a separate squelch detector and switching circuit with a carefully balanced hysteresis. The transformerless hifi quality audio power amplifier will drive any load between 8 ohms and indefinite such as internal speaker or external speaker/microphone or headset combinations having the above impedances.

The meter indicates the field strength during reception of a signal.

## **TRANSMITTER & MODULATOR SECTION:**

The transmitter section is designed for continuous heavy duty transmission of amplitude modulated (AM/A3) signals in the 26.965 to 27.755 MHz. (11 meter) citizens band.

The transmitter consists of a Phase Locked Loop circuit and an one-crystal controlled oscillator, of which output is synthesized in a class B mixer, followed by a double tuned filter, class AB1 buffers, and a highly efficient collector-modulated class C driver and power output stage, coupled by series and pi-matching filters to the antenna jack.

The modulator consists of an input audio filter, ALC amplifier integrated pre- and power amplifier and modulation transformer. This gives you the lowest possible modulation distortion and up to 100% modulation.

The input is designed for 500 ohm dynamic microphone or 32 ohm speaker/microphone combination with a 1K ohm resistor in series.

## **RECEIVE/TRANSMIT SWITCHING**

The receive/transmit switching is done by a single pole, single throw switch in the microphone and a combination of NPN and PNP switching transistors.

## **METER**

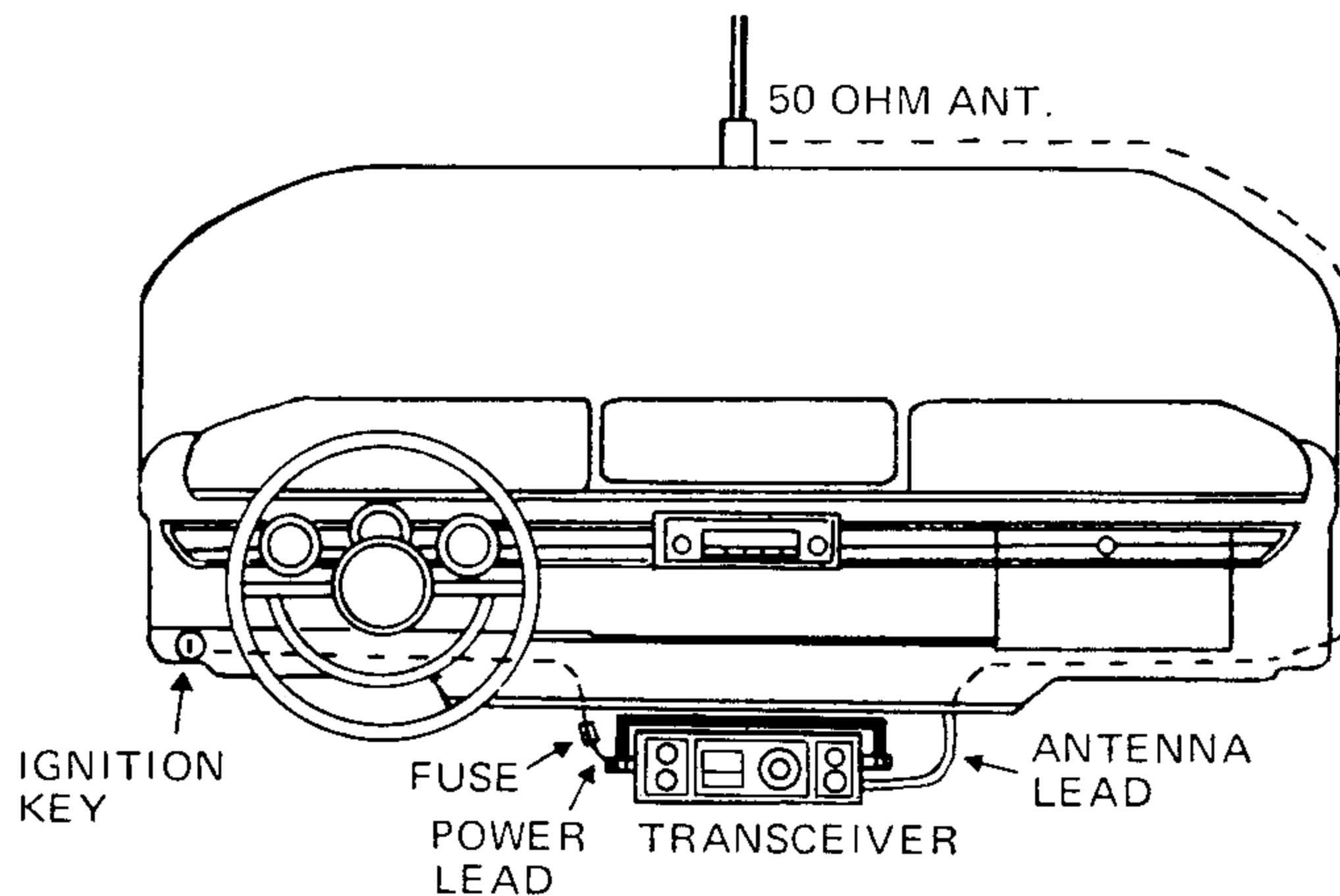
The combination meter provides you with the following functions:

During receive mode.....it indicates the incoming signal strength.

During transmit mode..... it indicates the output power.

## **MOBILE INSTALLATION**

Mounting bracket and screws are supplied for mounting the transceiver underneath the dashboard. Microphone hanger and screws are also supplied. For electrical connection, first make sure that the transceiver is turned off. Connect the red wire to the ACC terminal of the ignition switch or + terminal of battery and ground the black wire to the chassis of the vehicle. The black wire should be grounded as short as possible to minimize noise interference. This transceiver is designed for use with the negative ground system.



Connect the antenna plug to the antenna jack with an SWR-Meter inserted into the antenna cable.

Connect the microphone to the microphone jack.

Switch the transceiver ON.

The receiving, meter and the channel lamp, shall light up.

Turn the squelch control to min. (ANL OFF)

Turn the Volume control to max. Until you hear a rushing sound from the speaker.

Switch the channel selector to CH. 1.

Push the transmit button on the microphone and check with the SWR-Meter immediately the SWR of your antenna.

The SWR must be less than 1 to 2. Do this within 3 seconds, because if the SWR is higher than 1 to 2 it is very likely that the transmitting transistors will be damaged if you operate the transmitter too long with an antenna having a too high SWR. Also read carefully the recommendations on antennas.

NOTE: In case the SWR is too high, the Automatic protection circuit will switch off the transmitter.

If the SWR is less than 1 to 2 continue checkout. if it is more than 1 to 2 repair or replace your antenna.

Check that the meter needle is near the red mark during transmitting. Talk into the microphone. The meter needle shall move a little. Release the transmit button and switch the channel selector to channel 1,2 etc. until you receive a station.

Wait until this station stops to transmit and turn the Squelch control slowly to max. Until the background noise just disappears. When the station starts to transmit again, you will hear this station, but you will not hear the background noise during non transmitting periods.

## **OPERATING INSTRUCTIONS**

The transceiver is ready to operate when it is installed with an antenna properly connected. Note that the communication range differs depending upon the environment where the transceiver is operated.

You may reach 30 or 40 kilometers where no obstacle exists, but the range may be limited to 5 or 6 kilometers in cities where many high buildings disturb the communication.

- 1) Turn the set on by switching the LOW CH-OFF-HIGH CH. snap switch to the desired channel range and the channel dial will be lighted. Turn the volume control clockwise to increase the audio sound. Note that the volume control knob is only for adjusting the audio volume, not to increase the transmitting power.
- 2) Set the DELTA-TUNE for best reception.
- 3) Turn the squelch control clockwise until incoming noise is eliminated. Do not turn it excessively as the sensitivity may be reduced.
- 4) Turn the squelch control counter-clockwise to switch off the ANL (Automatic Noise Limiter).
- 5) Turn the channel selector knob to the desired channel.
- 6) For transmitting, press the button on the microphone and speak into it normally. Release the button for receiving.

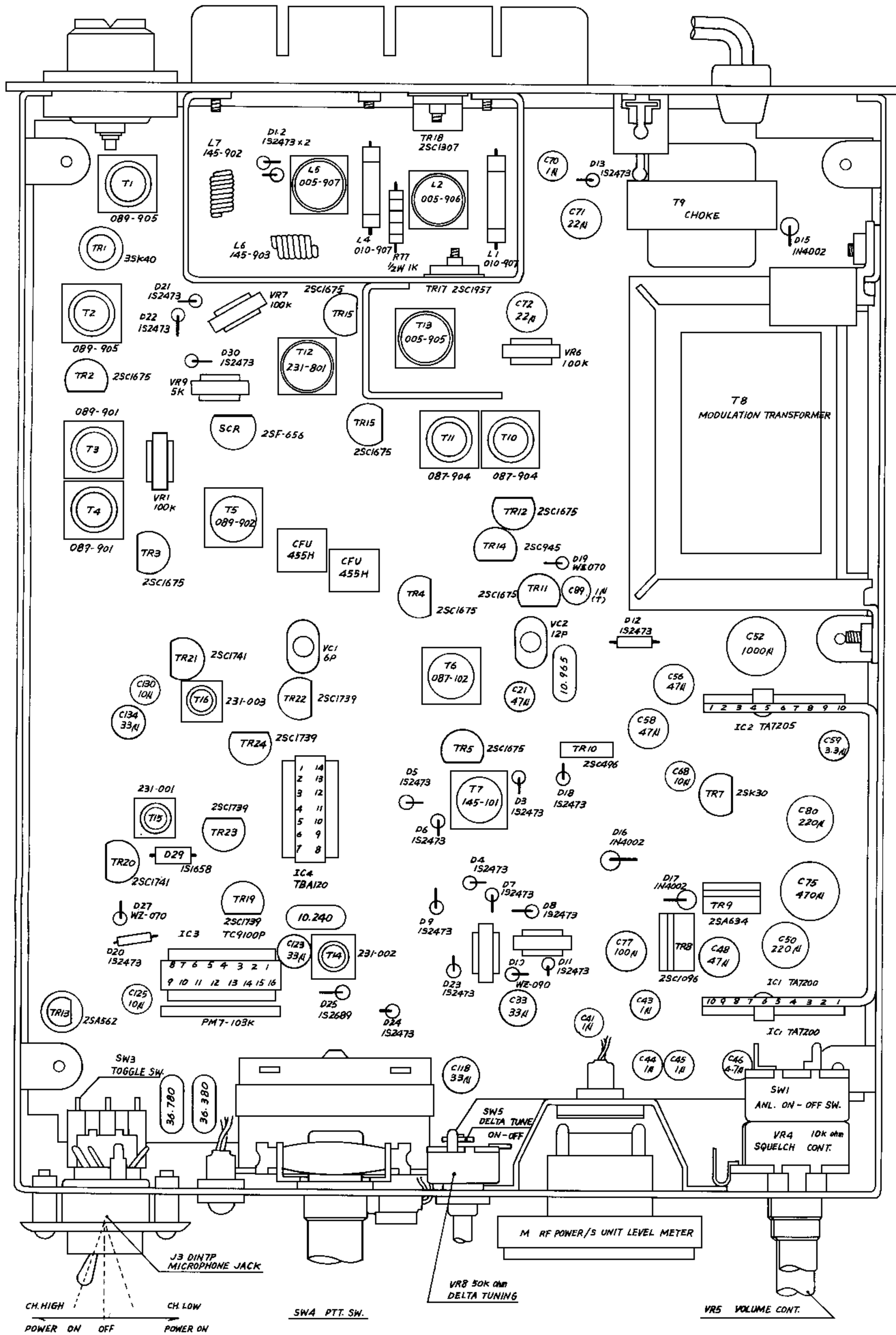
## **METER**

The meter reading indicates the signal strength at receiving, and functions as an output indicator at transmitting, and the meter pointer should be within the red zone under the normal conditions.

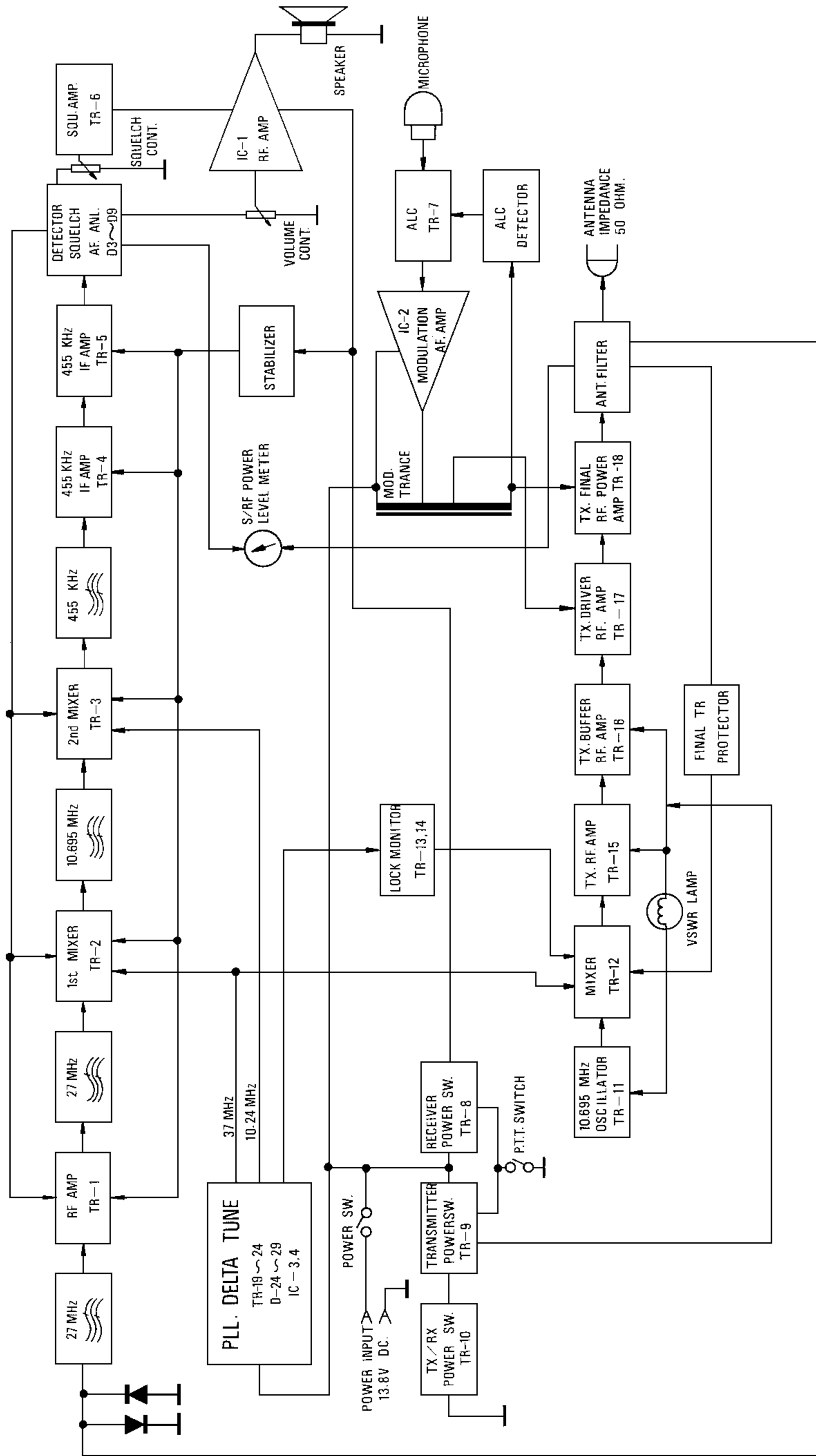
## **CIRCUIT PROTECTION INDICATION LAMP**

The lamp is on when the antenna is mismatched, and the transmitting circuit will be cut off.

# COMPLETE PARTS LAYOUT



# BLOCK DIAGRAM



# PARTS LIST for TS-680DX

DESIGNATION	PARTS NAME	PARTS NO.
MP-201	Front Frame	483014-S
MP-202B	Chassis Frame	502035
MP-203B	Back Parnel	504297
MP-105	Cabinet Cover (Upper)	483016
MP-124	Cabinet Cover (Lower)	514346
MP-107	Mounting Bracket	484085
	Front Plate (L)	524392
MP-304	Front Plate (R)	494187-R
	Brand Plate	524390
	Back Plate	524389
MP-110	Mouhting Bracket for Meter	484064
MP-208	Mounting Bracket for Output Transformer	504296
MP-362	Heatsink for IC.	504300
MP-353	Heatsink for 2SC1307A.	494251
MP-354	Heatsink for 2SC1307 B.	494252
MP-211	Meter Lamp Reflection Plate.	484063
MP-111	Call Switch Contact.	484086
MP-112	Call Switch Spring.	484087
MP-307	Knob for Delta tune Control.	494199
MP-117	Knob for Channel Selector.	484116
MP-17	Knob for Vol./squ. Control.	474011
MP-118	Nut for Channel Selector.	484073
MP-120	Screw for Mounting Bracket.	484098
	Channel Indicator Plate	514372
MP-356	Heatsink for 2SC496 (2SC1957)	494250
MP-19	Call Button.	484057
MP-5	Mounting Bracket for Speaker.	504335
MP-109	Mic Jack Mounting Supporter.	484056
MP-500	PLL Unit Cover (Upper)	524376
MP-501	PLL Unit Cover (Lower)	524386

## PARTS LIST for TS-680DX

DESIGNATION	PARTS NAME	PARTS NO.
IC1	Integrated Circuit.	TA-7200P
IC2	Integrated Circuit.	TA-7205P
IC3	Integrated Circuit.	TC-9100P
IC4	Integrated Circuit.	TBA-120
TR1	FET.	3SK-40
TR7	FET.	2SK-30
TR2,3,4,5, 11,12,15	Transistor.	2SC-1675
TR6, 14	Transistor.	2SC-945
TR8	Transistor.	2SC-1096
TR10	Transistor.	2SC-496
TR16	Transistor.	2SC-2086
TR17	Transistor.	2SC-1957
TR18	Transistor.	2SC-1307
TR19, 22, 23, 24	Transistor.	2SC-1739
TR20, 21	Transistor.	2SC-1741
TR9	Transistor.	2SA-634
TR13	Transistor.	2SA-562
SCR	SCR.	2SF-656
D1~14,18,20~24,30	Silicon Diode.	1S2473
D15, 16, 17	Silicon Diode.	1N4002
D25	Varicap Diode	1S2689
D29	Varicap Diode.	1S1658
D26	Zener Diode.	WZ-060
D19, 27	Zener Diode.	WZ-070
D10, 28	Zener Diode.	WZ-080
CF	Ceramic Filter.	CFU-455H
J2	Ext Speaker Jack.	SJ-296
J1	Antenna Jack.	MRM/INCH
J3	Microphone Jack. DIN Type 7p.	CS279

## PARTS LIST for TS-680DX

DESIGNATION	PARTS NAME	PARTS NO.
VR1, 3	Semi Variable Resistor 100K ohm.	SVR100K S2
VR2	Semi Variable Resistor 10K ohm.	SVR010K S2
VR6, 7	Semi Variable Resistor 100K ohm.	SVR100K S3
VR9	Semi Variable Resistor 5K ohm.	SVR005K S3
VR5	Variable Resistor (Volume) 50K ohm.	VR1650KB
VR4	Variable Resistor (Squelch) 10K ohm.	VR16 10K BS
VR8	Variable Resistor (D Tune) 10K ohm.	VR1310K BS
T1, 2	RXRF Tuning Coil.	089-905
T3, 4	IFT 10.7 MHz	089-901
T5	IFT 455 KHz	089-902
T6	IFT 455 KHz	087-102
T7	IFT 455KHz	145-101
T8	Modulation Trans.	TS-660
T9	Power Filter Trans.	EI-24
T10, 11	TX Mixer Coil.	087-904
T12	TX 27MHZ Filter Coil.	231-801
T13	TX 27MHZ Buffer Tuning Coil.	005-904
T14	10.24 MHz OSC Coil.	231-002
T15	PLL VCO Coil.	231-001
T16	VCO AMP Coil.	231-003
L1, 4	TX Power Choke.	010-907
L2	TX Driver Tuning Coil.	005-906
L3	TX Final Choke Coil.	005-901
L5	TX Final Tuning Coil.	005-907
L6	TX $\pi$ Matching Coil.	145-903
L7	TX $\pi$ Matching Coil.	145-902
F1	Fuse 5A	F-5A
M	Meter	510052
SP	Speaker	77P-06
PL1~4	Pilot Lamp 14V-80mA	PL-14-80
SW3, 6	Toggle Switch	8A-2021
SW4	PLL Rotary Switch	SRH-101U
MIC.	Microphone Complete	22-256-28

## SPECIFICATIONS for TS-680DX

Semiconductors:	4 Integrated Circuits, 2 FET, 22 Transistors. 1 SCR, 23 Silicon diode. 2 Varicap, 5 Zener diode.
Transmitter System:	Synthesized PLL controlled. Collector modulation AM.
Frequency:	80 Channels on 27 MHz.
Output Power:	10 Watts at 13.8V DC.
Band Width:	8 KHz. (max.)
Antenna impedance:	50-52 ohms.
Receiver System:	Double conversion superheterodyne, PLL controlled.
Sensitivity:	1 $\mu$ V or better for 100mW output, 10 dB signal to noise ratio.
Intermediate Frequency:	1st I.F. 10.7MHz, 2nd I.F. 455KHz.
Receiver Selectivity:	40 dB down at 10 KHz. or more.
Squelch Sensitivity:	1 $\mu$ V.
Audio Output Power:	2 watts in 10% distortion.
Power Source:	11~16V D.C. Negative Ground. Fuse 5A.
Microphone:	Dynamic type with press-talk switch. Impedance 500 ohm.
Speaker:	Dynamic type, Voice coil Impedance 8 ohm.
Size:	156 $\times$ 58 $\times$ 205 mm.
Weight:	2.3 kg.
Accessories:	Mounting bracket, Mounting hardware, power cord.

**SOMMERKAMP ELECTRONIC SAS**

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