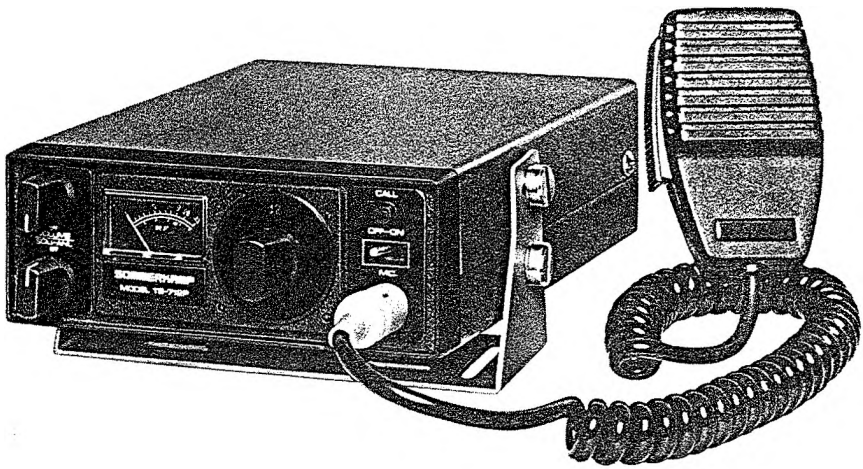
# SOMMERKAMP®

## CITIZENS BAND TRANSCEIVER

## INSTRUCTION MANUAL

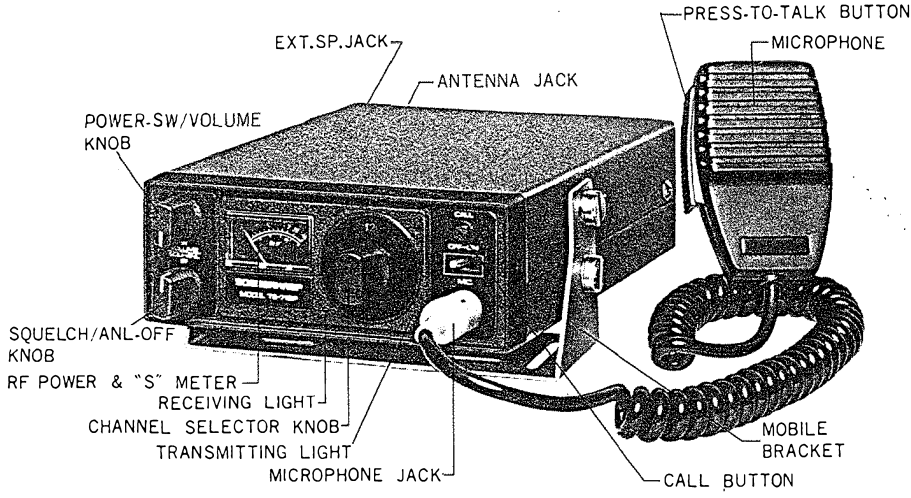


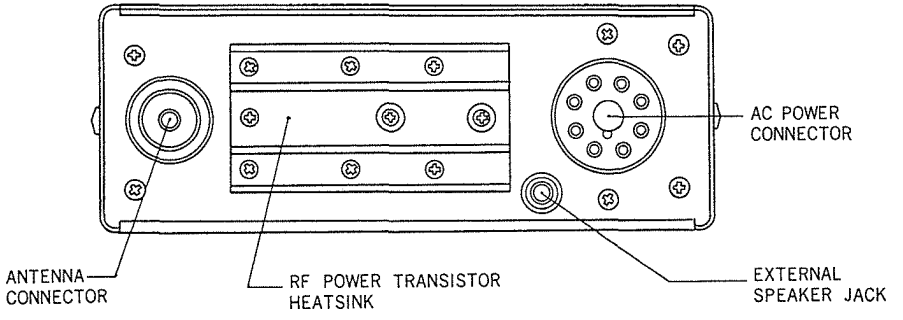
## MODEL TS-712P

**SOMMERKAMP ELECTRONIC SAS**

CH-6903 LUGANO, P.O. BOX 176
SWITZERLAND
TEL.91 688543 TELEX:79314

## CONTROL LOCATIONS:




## PACKING LIST:

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

1 Transceiver TS-712P
1 Mounting bracket
4 Screw for Mounting bracket
1 Microphone hanger
1 AC cord with 8 pin connector
1 Microphone

## GENERAL DESCRIPTION

Your SOMMERKAMP TS-712P transceiver has been designed for continous heavy duty base station application. It can be operated with a microphone and internal speaker or headset, speaker/microphone combination, telephoneset incorporating automatic voice operated transmit/receive switching, external selective calling with automatic answerback and many more.

## GENERAL:

The transceiver is designed to operate from 110/220 Volt AC as a base station. Its straight forward 12 channel capability allows it to operate on any combination of frequencies within 26.5 and 29.7 MHz by inserting the corresponding xtals and retuning the transceiver if required. The Xtals in the transceiver are standard 27 MHz CB Xtals with plus or minus 455 KHz receiver offset. No special synthesiser or IF Xtals are required.

## RECEIVER SECTION

The receiver section is designed to receive amplitude modulated (AM/A3) signals in the 27 MHz (11 meter) citizens band. The unique combination of low noise Field Effect Transistors (FET), single conversion, a combination of mechanical ceramic, and L/C filters, fully automatic noise limiter 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 fuily 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 seperate 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 indefininite 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 continous heavy duty transmission of amplitude modulated (AM/A3) signals in the 27 MHz. (11 meter) citizens band.

The transmitter consists of an crystal controlled oscillator. The output of this oscillator is amplified in 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 transistor, 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 to 10K ohm dynamic microphone or 8 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.

## AC POWERSUPPLY

The AC powersupply consists of the heavy duty power transformer, a 4 diode full wave bridge rectifiers and a heavy duty voltage stabiliser for 13.5 Volt for the receiver and transmitter sections.

## BASE STATION INSTALLATION AND CHECKOUT

Unpack the transceiver carefully and check for exterior damages and the accessories.

Connect the 3 wire AC cord to an AC plug in the following manner:

1. blue to AC terminal
2. brown to AC terminal
3. yellow/green to the earth terminal

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

Connect the microphone to the microphone jack.

Place the transceiver in operating position and connect the AC plug to a 220 Volt 50 Hz AC outlet.

Check very carefully that nothing touches the back panel and that there is a min. 10 cm space between the backpanel and any object nearby because the transmitting transistors will heat up to 100 degree Centigrade and carry a voltage of 14 Volt DC and high power RF.

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 channelselector 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 demaged if you operate the transmitter too long with a antenna having a too high SWR. Also read carefully the recommendations on antennas.

If the SWR is less than 1 to 2 continue installation. 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 ectr, 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 ON-OFF snup switch to ON 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) Turn the squelch control clockwise until incoming noise is eliminated. Do not turn it excessively as the sensitivity may be reduced.

3) Turn the squelch control counter-clockwise to switch off the ANL (Automatic Noise Limiter)

4) Turn the channel selector knob to the desired channel.

5) 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.

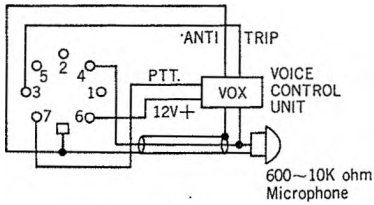
## MICROPHONE JACK

The 7-pin DIN standard accessory jack has the following internal connections:

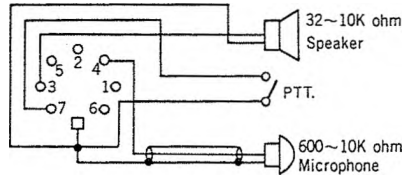
1. Internal speaker (Z 8 ohm)
2. AF. out for selective call.
3. Audio output (Z 8 ohm-10K ohm)
4. Microphone input (Z 600-10K ohm)
5. N/C
6. +12V for VOX unit etc.
7. Transmit/Receive switching.

Always operate the transceiver with the microphone plug inserted in the microphone jack, or with the following external connections:

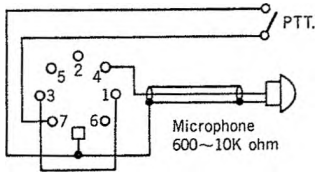
1. Microphone with VOX.



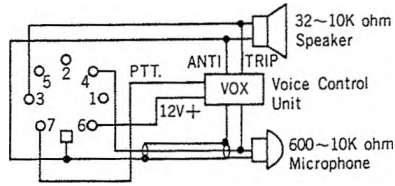

2. Headset or Telephoneset with PTT.



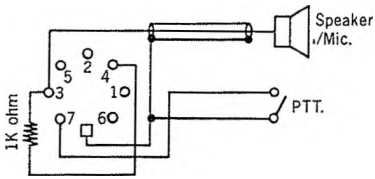

3. External microphone



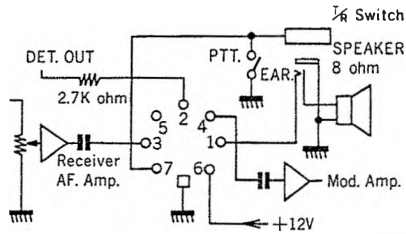

4. Headset or Telephoneset with VOX



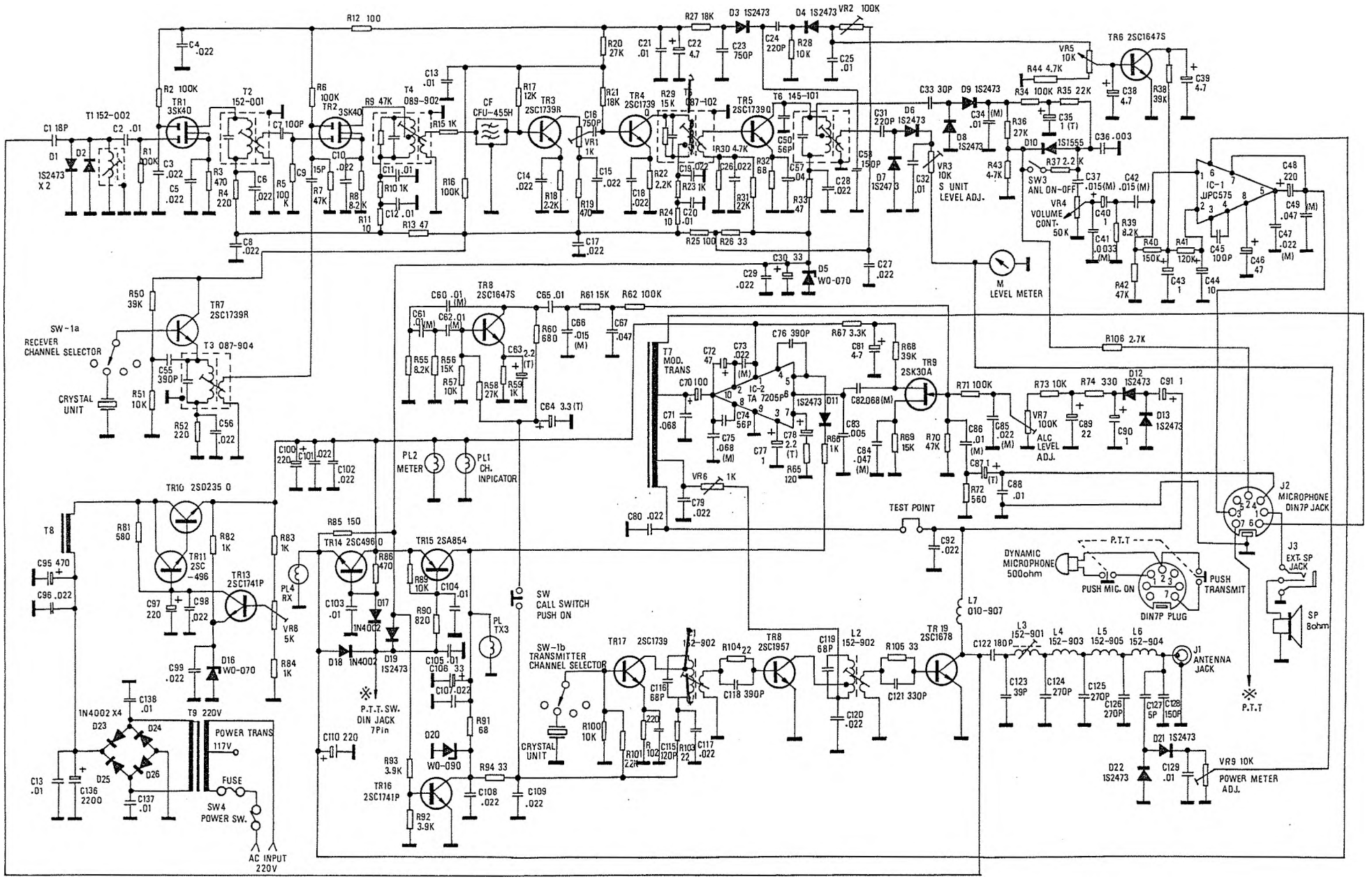

5. External microphone/speaker with PTT.



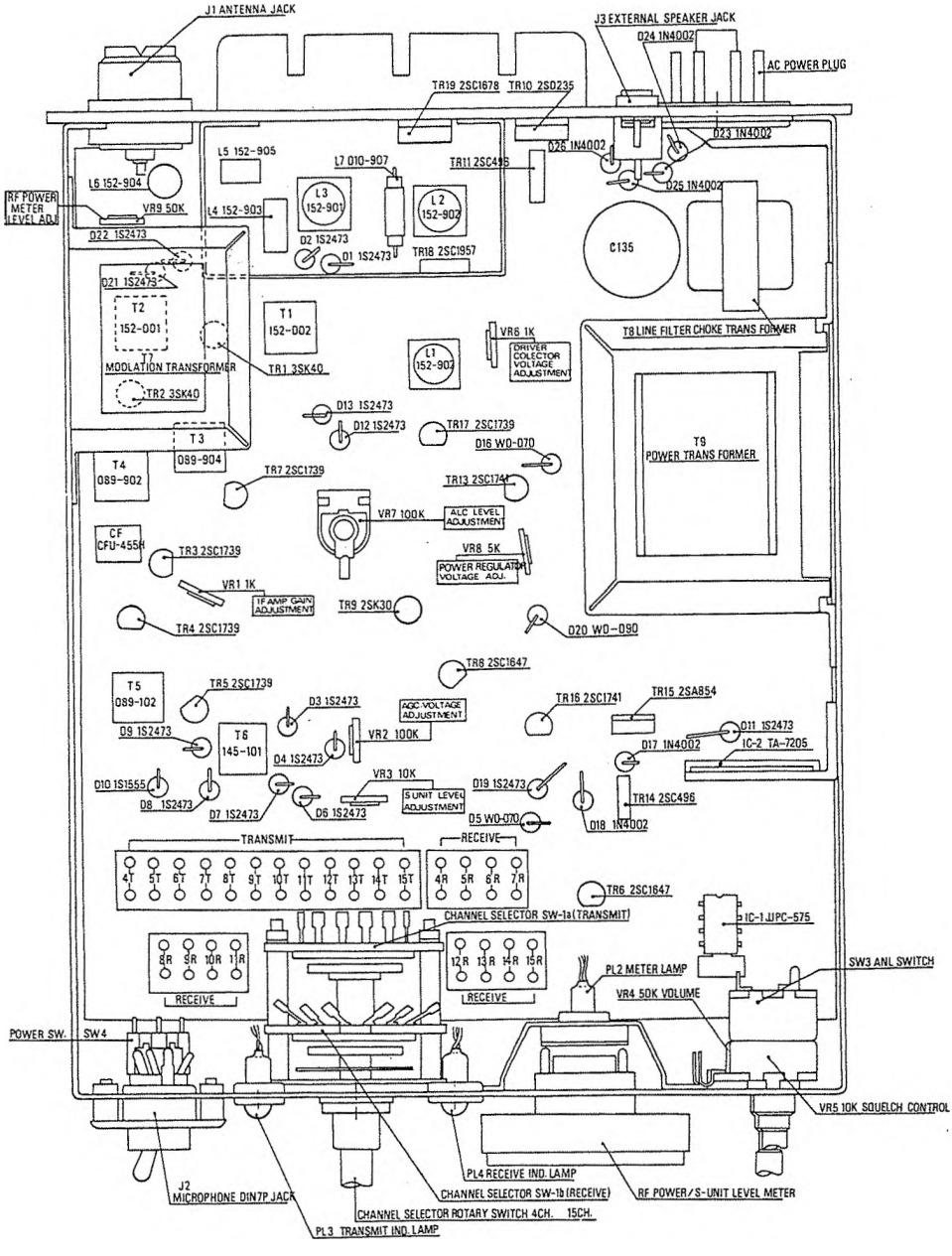

6. Internal connection



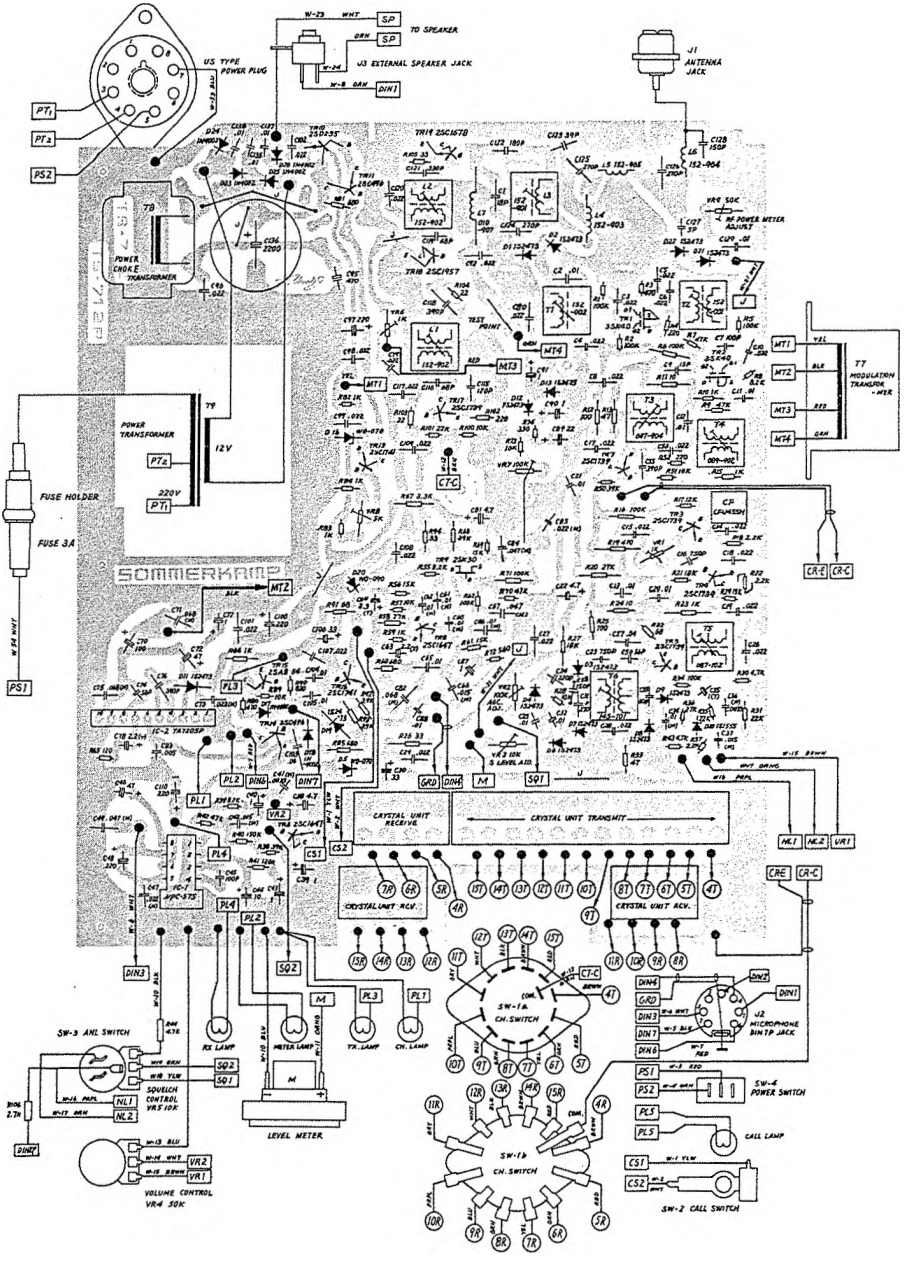
# SCHEMATIC DIAGRAM



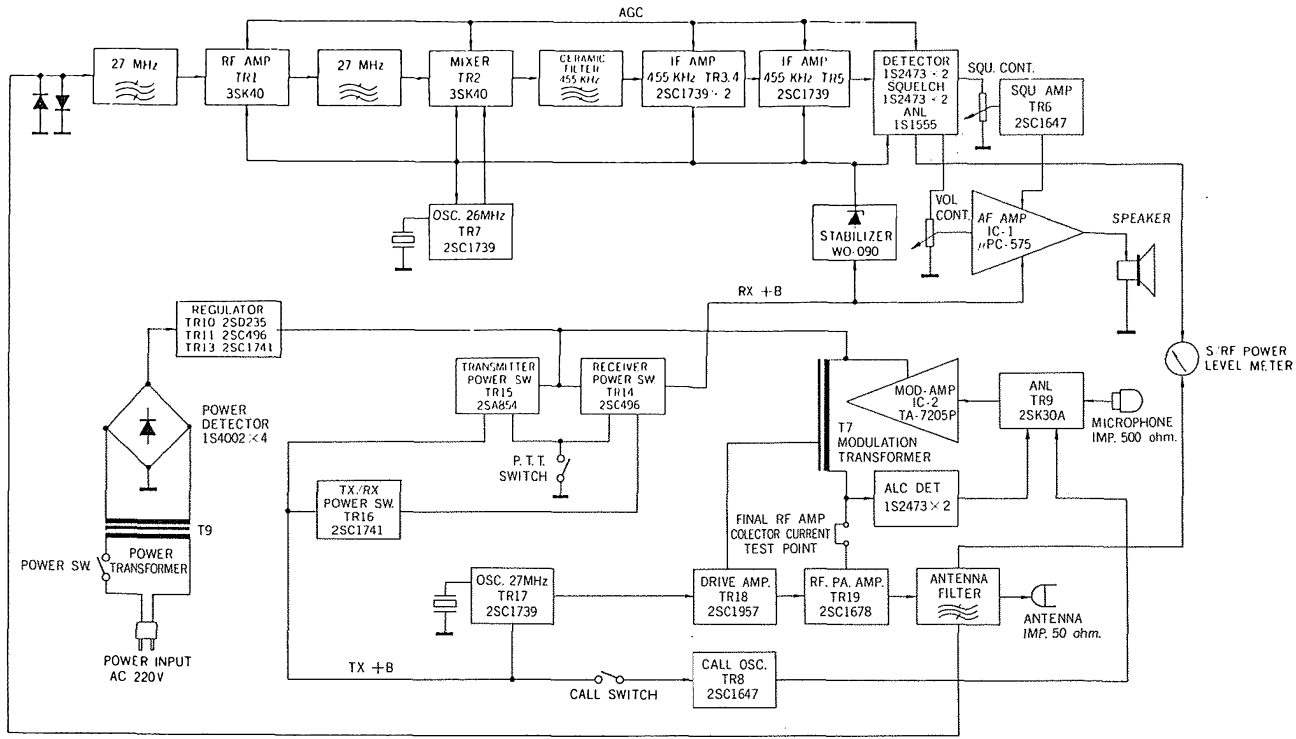
# MAIN PARTS LAYOUT



# PRINTED CIRCUIT BOARD PARTS LAYOUT



# BLOCK DIAGRAM



# PARTS LIST for TS-712P

| DESIGNATION | PARTS NAME | PARTS NO. |
|---|---|---|
| MP-201B | Front Frame. | 483014-SB |
| MP-202B | Chassis Frame. | 502035 |
| MP-351B | Back Pannel. | 494257-B |
| MP-105 | Cabinet Cover (Upper). | 483016 |
| MP-124 | Cabinet Cover (Lower). | 502034 |
| MP-107 | Mounting Bracket. | 484085 |
| MP-303 | Front Plate (L). | 494187-L |
| MP-350 | Front Plate (R). | 494258 |
| MP-401 | Brand Plate. | 504336 |
| MP-402 | Back Plate. | 504327 |
| MP-110 | Mounting Bracket for Meter. | 484064 |
| MP-403 | Heatsink for IC. | 504329 |
| MP-353 | Heatsink for 2SC1237 (2SC1678) A. | 494251 |
| MP-354 | Heatsink for 2SC1237 (2SC1678) B. | 494252 |
| MP-211 | Meter Lamp Reflection Plate. | 484063 |
| MP-212 | Channel Indicator Screen. | 484107 |
| MP-214 | Mounting Bracket for Channel Lamp. | 484108 |
| MP-111 | Call Switch Contact. | 484086 |
| MP-112 | Call Switch Spring. | 484087 |
| 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 |
| MP-404 | Channel Indicator Plate. | 504325 |
| MP-405 | Heatsink for 2SC1957 | 504328 |
| MP-19 | Call Button. | 484056 |
| MP-406 | Mounting Bracket for Speaker. | 504335 |
| MP-109 | Supporter for MIC. Consent. | 484084 |
| | | |
| J1 | Antenna Jack | MRM/INCH |
| J2 | Microphone Jack DIN Type 7P. | CS279 |
| J3 | EXT. Speaker Jack. | SJ-296 |
| | | |
| VR5 | Variable Resistor (Volume) 50K ohm | VR1650KB |
| VR4 | Variable Resistor (Squelch) 10K ohm | VR1610KBS |
| VR1 | Semi Valiable Resistor 1K ohm | SVR001KS3 |
| VR6 | Semi Valiable Resistor 1K ohm. | SVR001KS2 |
| VR8 | Semi Valiable Resistor 5K ohm. | SVR005KS3 |
| VR3 | Semi Valiable Resistor 10K ohm. | SVR010KS2 |
| VR9 | Semi Valiable Resistor 10K ohm. | SVR010KS3 |
| VR2 | Semi Valiable Resistor 100K ohm. | SVR100KS2 |
| VR7 | Semi Valiable Resistor 100K ohm. | SVR100KF |
| | | |
| L1 | TX. OSC. Tuning Coil. | 152-902 |
| L2 | TX. Buffer Tuning Coil. | 152-902 |
| L3 | TX. Final Tuning Coil. | 152-901 |

# PARTS LIST for TS-712P

| DESIGNATION | PARTS NAME | PARTS NO. |
|---|---|---|
| L4 | TX. Filter Coil. | 152-903 |
| L5 | TX. Filter Coil. | 152-905 |
| L6 | TX. Filter Coil. | 152-904 |
| L7 | TX. Final Choke Coil. | 010-907 |
| T1 | RX. RF Tuning Coil. | 152-002 |
| T2 | RX. RF Amp. Tuning Coil. | 089-902 |
| T3 | RX. Local OSC. Coil. | 087-904 |
| T4 | I. F. T. 455 KHz 1st. | 089-902 |
| T5 | I. F. T. 455 KHz 2nd. | 087-102 |
| T6 | I. F. T. 455 KHz 3rd. | 145-101 |
| T7 | Modulation Transformer. | E1-42-712P |
| T8 | Power Filter Choke Transformer. | E1-25-732P |
| T9 | Power Transformer. | E1-57-732P |
| | | |
| TR1, 2 | FET | 3SK40 |
| TR 9 | FET | 2SK30A |
| TR4, 5, 7, 3, 17, | Transistor | 2SC1739-Q |
| TR13, 16 | Transistor | 2SC1741-P |
| TR6, 8 | Transistor | 2SC1647-S |
| TR14, 11 | Transistor | 2SC496-O |
| TR18 | Transistor | 2SC1957 |
| TR19 | Transistor | 2SC1678 |
| TR10 | Transistor | 2SDZ35-O |
| TR15 | Transistor | 2SA854-Q |
| | | |
| D1～9, 11～13, 19, 21, 22 | Silicon Diode | 1SZ473 |
| D10 | Silicon Diode | 1S1555 |
| D17, 18, 23～26 | Silicon Diode | 1N4002 |
| D16 | Zener Diode | WO-070 |
| D5, 20 | Zener Diode | WO-090 |
| | | |
| IC-1 | Integrated Circuit. | UPC575 C2 |
| IC-2 | Integrated Circuit. | TA7205P |
| SP | Speaker. | SP-77-8 |
| PL1, 2 | Pilot Lamp. | PL-14-80 |
| PL3, 4 | Pilot Lamp. | PL-12-40 |
| CF | Ceramic Filter. | CFM-455H |
| EP-203 | Socket for Crystal Unit 4P | XS-4P |
| EP-503 | Socket for Crystal Unit 12P | XS-12P |
| EP-502 | AC. Power Cord | W-732AC |
| F1 | Fuse 3A | F-3A |
| SW-1a～1b | Channel Selector Rotary Switch. | SRM-2-2-12 |
| M | Meter | D33B35R |
| MIC. | Microphone | 22-256-28 |
| SW4 | Power Toggle Switch | 8A-2011 |
| | | |

## Specification for TS-712P

| | |
|---|---|
| Semiconductor: | 2 Integated Circuits,<br>3 FET, 15 Transistors,<br>22 Silicon diodes,<br>3 Zener diodes. |
| Transmitter System: | Crystal controlled.<br>Collector modulation AM. |
| Frequency: | 12 Channel on 27 MHz Band. |
| Input Power: | 0.5 Watts. (3 Watts). |
| Band Width: | 8 KHz (max). |
| Antenna Impedance: | 50~52 ohm. |
| Receiver System: | Single conversion superheterodyne.<br>Crystal controlled. |
| Sensitivity: | 1$\mu$V or better for 500 mW output.<br>10 dB signal to noise ratio. |
| Intermediate Frequecy: | 455 KHz. |
| Selectivity: | 30 dB down at 10 KHz. |
| Squelch Sensitivity: | 1 $\mu$V |
| Audio Output Power: | 2W watts in 10% distortion. |
| Power Source: | 220V AC. |
| Fuse: | 3A. |
| Microphone: | Dynamic type Impedance 500 ohm.<br>with Press-to-talk switch. |
| Speaker: | Dynamic type voice coil impedance 8 ohm. |
| Size: | 156×58×205 m/m. |
| Weight: | 2.3 kg. |
| Accessories: | Mounting bracket, Mounting hard ware,<br>AC power cord, Microphone hanger. |