

## SPECIFICATIONS for TS-680EDX

### Semiconductors:

- 4 Integrated Circuits,
- 2 FET, 22 Transistors.
- 1 SCR, 24 Silicon diode.
- 2 Varicap, 5 Zener diode.

### Transmitter System:

Synthesized PLL controlled.  
Collector modulation AM.

### Frequency:

80 Channels on 27 MHz.

### Output Power:

25 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.

### Microphone:

Fuse 10A.

Dynamic type with press-talk switch.

Impedance 500 ohm.

Dynamic type, Voice coil Impedance 8 ohm.

156X58X290 mm.

2.5kg.

### Accessories:

Mounting bracket, Mounting hardware,  
power cord.

## SOMMERKAMP ELECTRONIC SAS

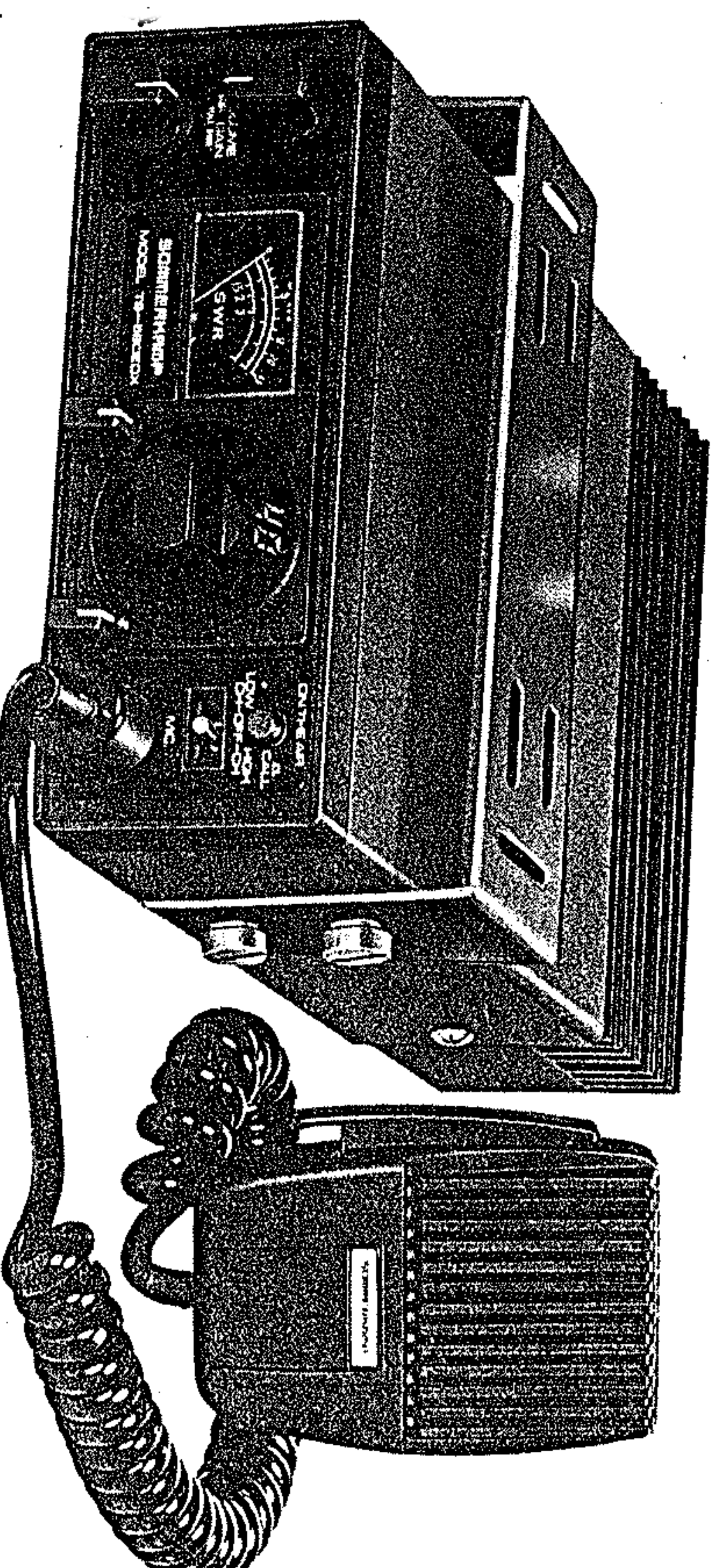
CH-6903 LUGANO, P.O. BOX 176

SWITZERLAND

TEL. 91 688543 TELEEX: 79314

# SOMMERKAMP®

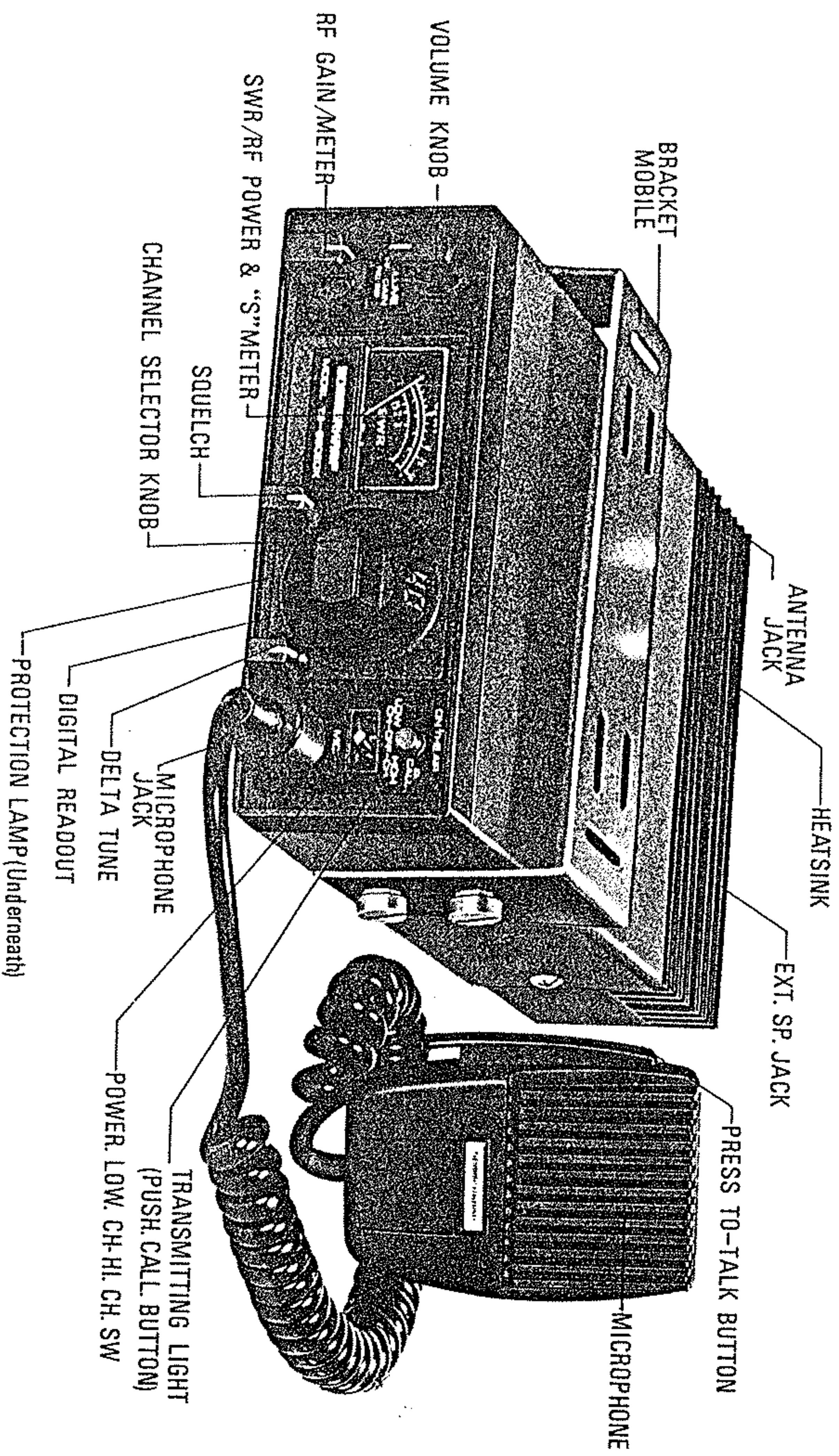
## CITIZENS BAND TRANSCEIVER INSTRUCTION MANUAL



MODEL: TS-680EDX



## CONTROL LOCATIONS:



## PACKING LIST

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

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

## GENERAL DESCRIPTION

Your SOMMERKAMP TS-680EDX 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 27.855 MHz.

## RECEIVER SECTION

The receiver section is designed to receive amplitude modulated (AM/A3) signals in the 26.965 to 27.855 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 trans-formerless 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 27.855 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.

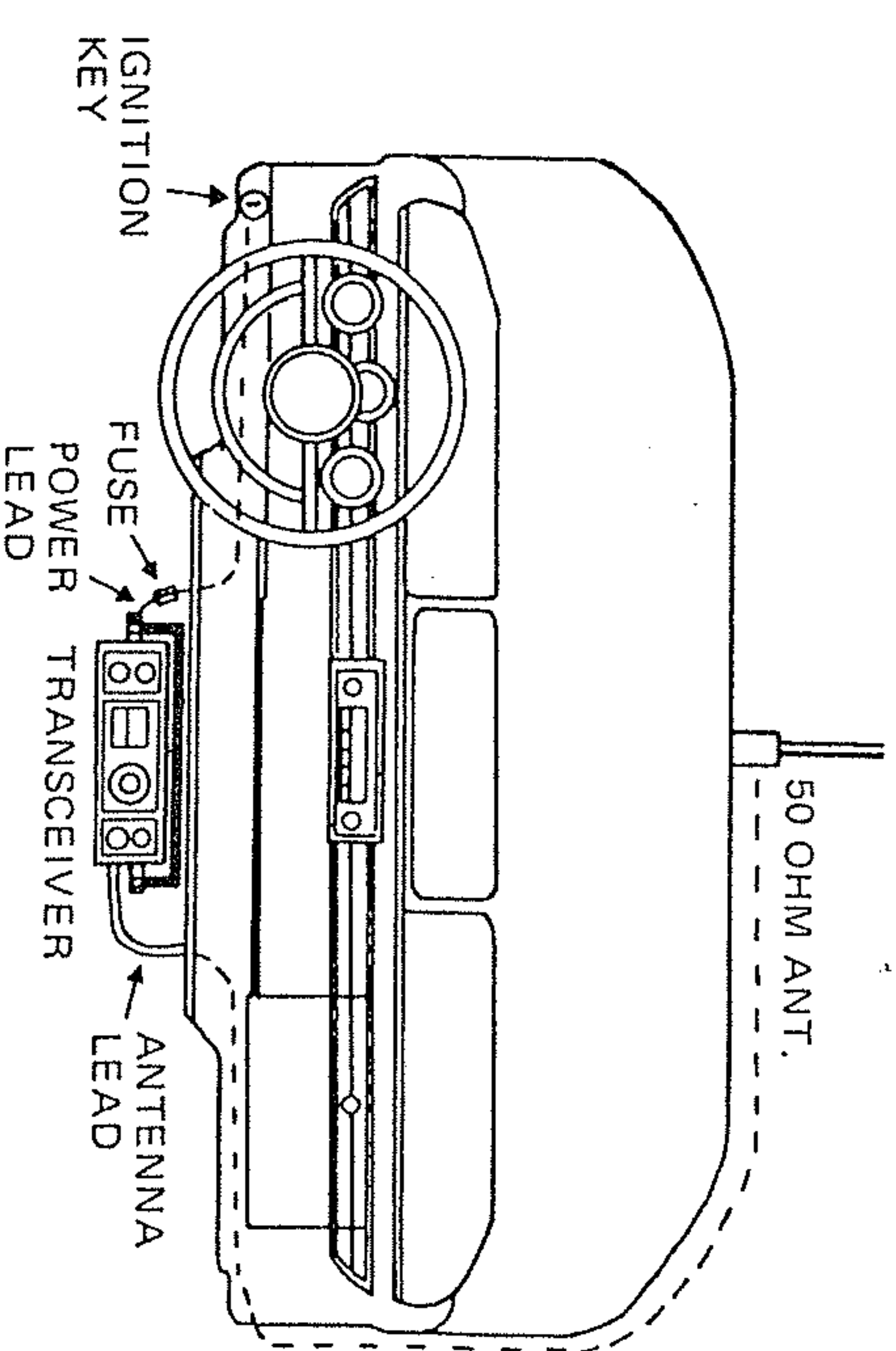
During transmit mode.....it indicates the output power.

For normal operation, be sure if the RF GAIN knob is pushed.

For checking the SWR of your antenna, pull the RF GAIN knob, then the meter will function as SWR meter.

## 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 the SWR of your antenna with the SWR-Meter immediately by pulling the RF GAIN knob. 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 a 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 RF GAIN control to the maximum clockwise position.
- 6) Turn the channel selector knob to the desired channel.
- 7) 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. This lamp is located underneath the channel lens.

## LIST OF CHANNEL FREQUENCIES

| CH. | LOW.CH. (MHz) | HIGH.CH. (MHz) | CH. | LOW.CH. (MHz) | HIGH.CH. (MHz) |
|-----|---------------|----------------|-----|---------------|----------------|
| 1   | 26. 965       | 27. 415        | 21  | 27. 215       | 27. 665        |
| 2   | 26. 975       | 27. 425        | 22  | 27. 225       | 27. 675        |
| 3   | 26. 985       | 27. 435        | 23  | 27. 255       | 27. 705        |
| 4   | 27. 005       | 27. 455        | 24  | 27. 235       | 27. 685        |
| 5   | 27. 015       | 27. 465        | 25  | 27. 245       | 27. 695        |
| 6   | 27. 025       | 27. 475        | 26  | 27. 265       | 27. 715        |
| 7   | 27. 035       | 27. 485        | 27  | 27. 275       | 27. 725        |
| 8   | 27. 055       | 27. 505        | 28  | 27. 285       | 27. 735        |
| 9   | 27. 065       | 27. 515        | 29  | 27. 295       | 27. 745        |
| 10  | 27. 075       | 27. 525        | 30  | 27. 305       | 27. 755        |
| 11  | 27. 085       | 27. 535        | 31  | 27. 315       | 27. 765        |
| 12  | 27. 105       | 27. 555        | 32  | 27. 325       | 27. 775        |
| 13  | 27. 115       | 27. 565        | 33  | 27. 335       | 27. 785        |
| 14  | 27. 125       | 27. 575        | 34  | 27. 345       | 27. 795        |
| 15  | 27. 135       | 27. 585        | 35  | 27. 355       | 27. 805        |
| 16  | 27. 155       | 27. 605        | 36  | 27. 365       | 27. 815        |
| 17  | 27. 165       | 27. 615        | 37  | 27. 375       | 27. 825        |
| 18  | 27. 175       | 27. 625        | 38  | 27. 385       | 27. 835        |
| 19  | 27. 185       | 27. 635        | 39  | 27. 395       | 27. 845        |
| 20  | 27. 205       | 27. 655        | 40  | 27. 405       | 27. 855        |

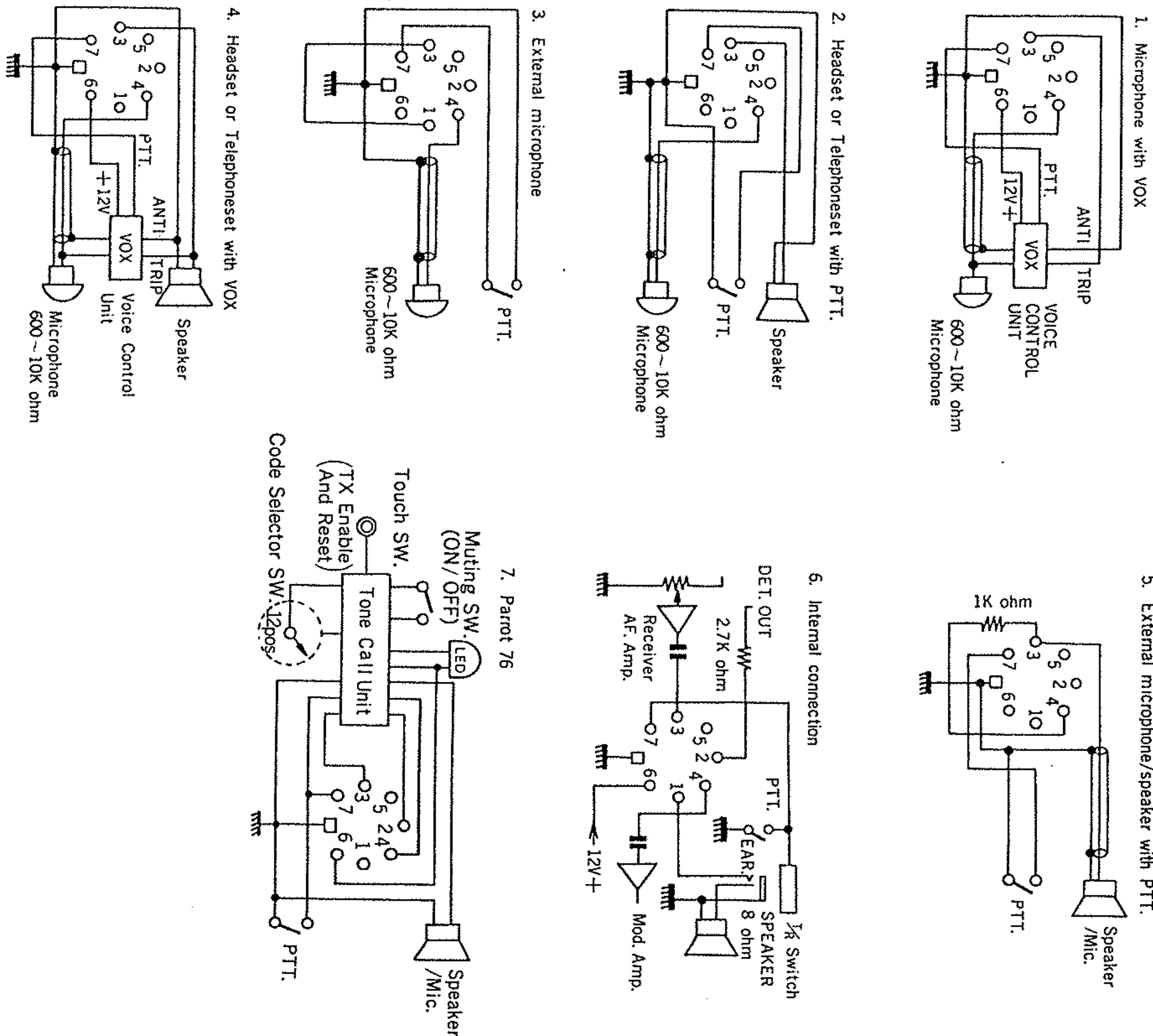


## MICROPHONE JACK

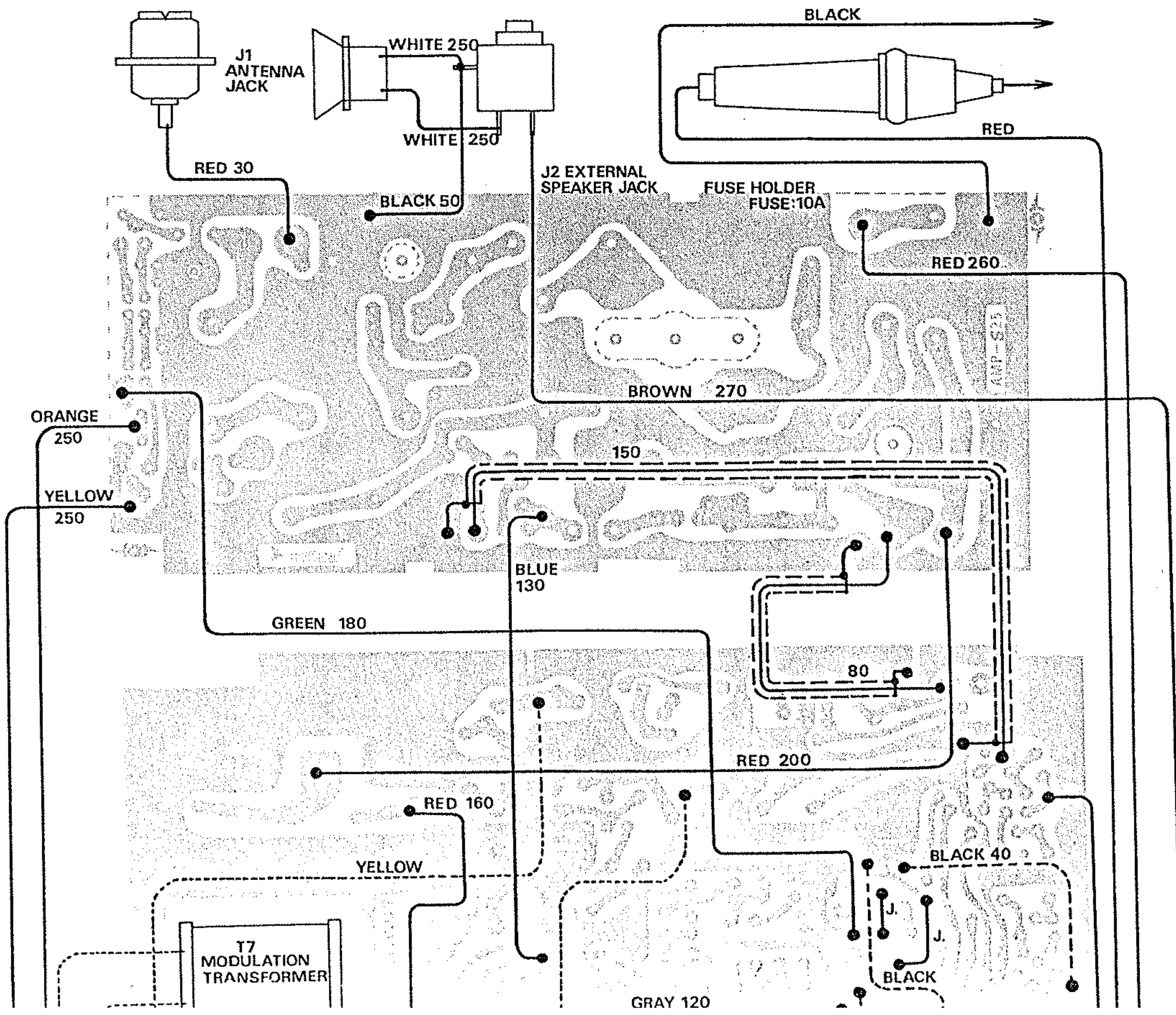
The 7-pin DIN standard accessory jack has the following internal connections:

1. Internal speaker
  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.
- Case = ground

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



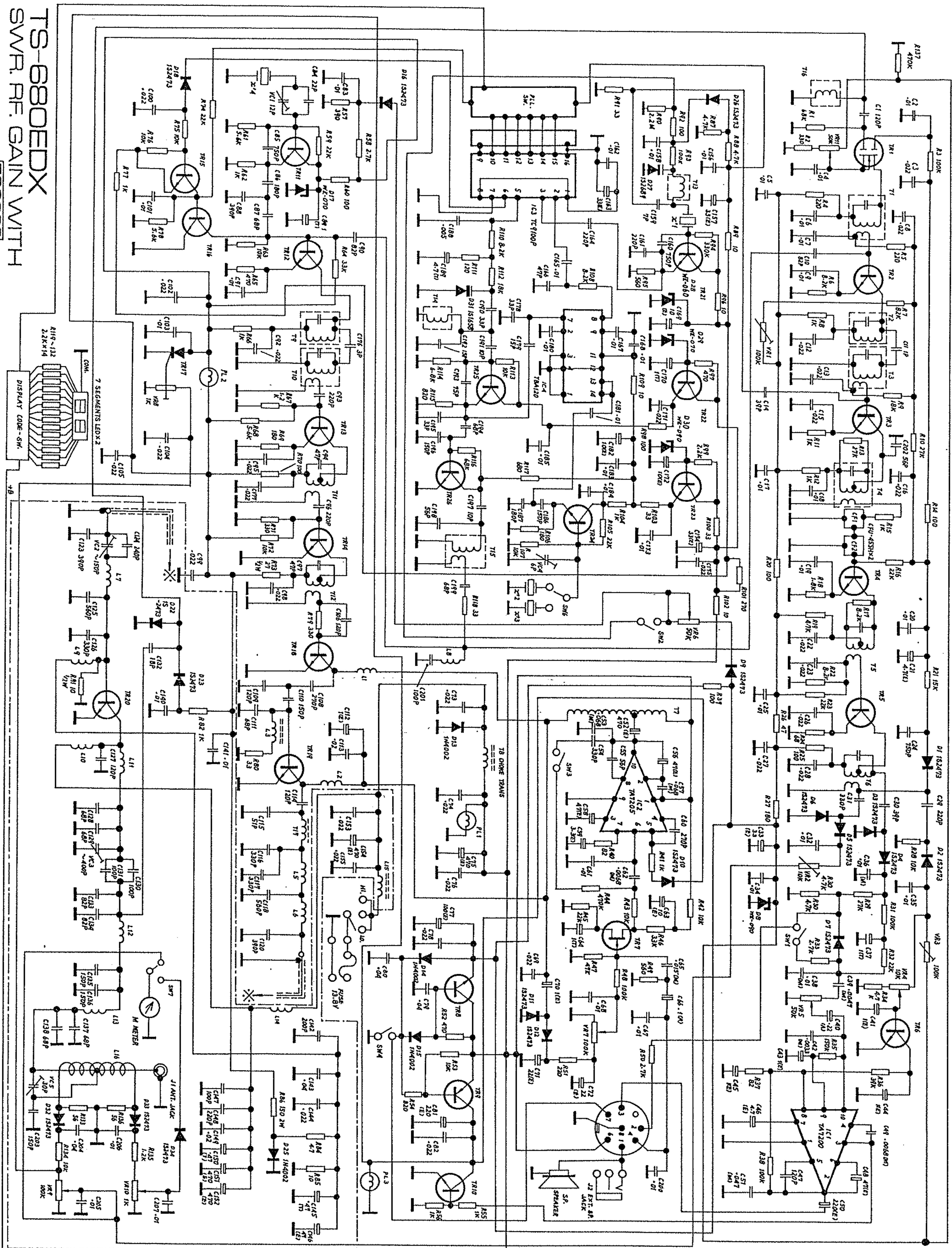
## PRINTED CIRCUIT BOARD PARTS LAYOUT





# CIRCUIT DIAGRAM

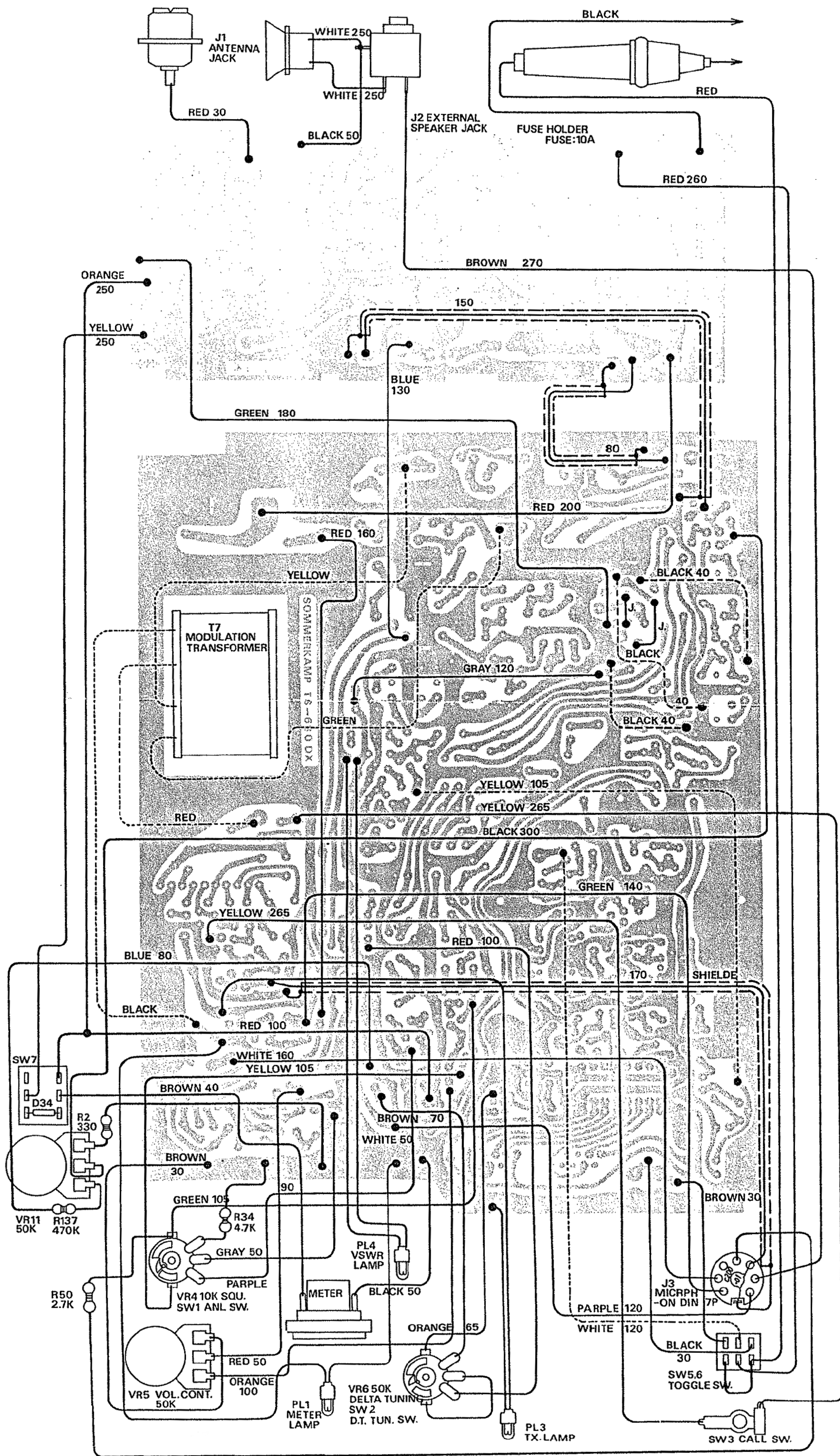
## TS-680EDX SWR, RF. GAIN WITH [532089]



|      |                   |      |        |      |                      |      |                        |             |                         |
|------|-------------------|------|--------|------|----------------------|------|------------------------|-------------|-------------------------|
| TR14 | 25C2086 OF 25C498 | TR17 | 25F656 | TR8  | 25C1096 OF 25D235(0) | TR1  | 25K30                  | TR21, 24-26 | 25C1939(0) OF 25C839(0) |
| TR18 | 25C1957 OF 25C496 | TR20 | MRF454 | TR19 | 25C1678 OF 25C1306   | TR15 | 25A562(0) OF 25A854(0) | TR1         | 35K40 (L)               |
|      |                   |      |        |      |                      |      |                        | TR22, 23    | 25C1941(0) OF 25C2060   |
|      |                   |      |        |      |                      |      |                        | TR10        | 25C496(0) OF 25C1449(0) |



# PRINTED CIRCUIT BOARD PARTS LAYOUT

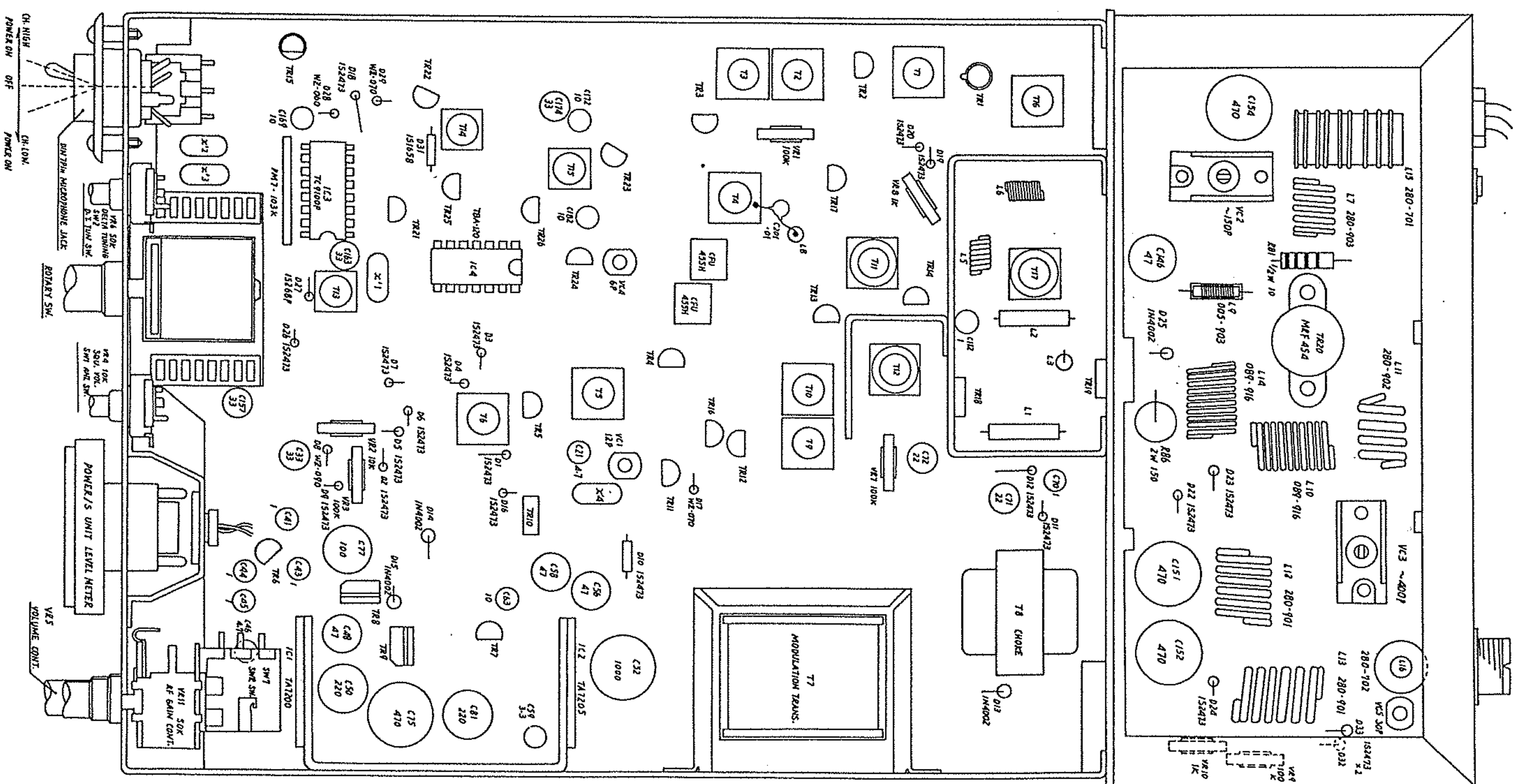
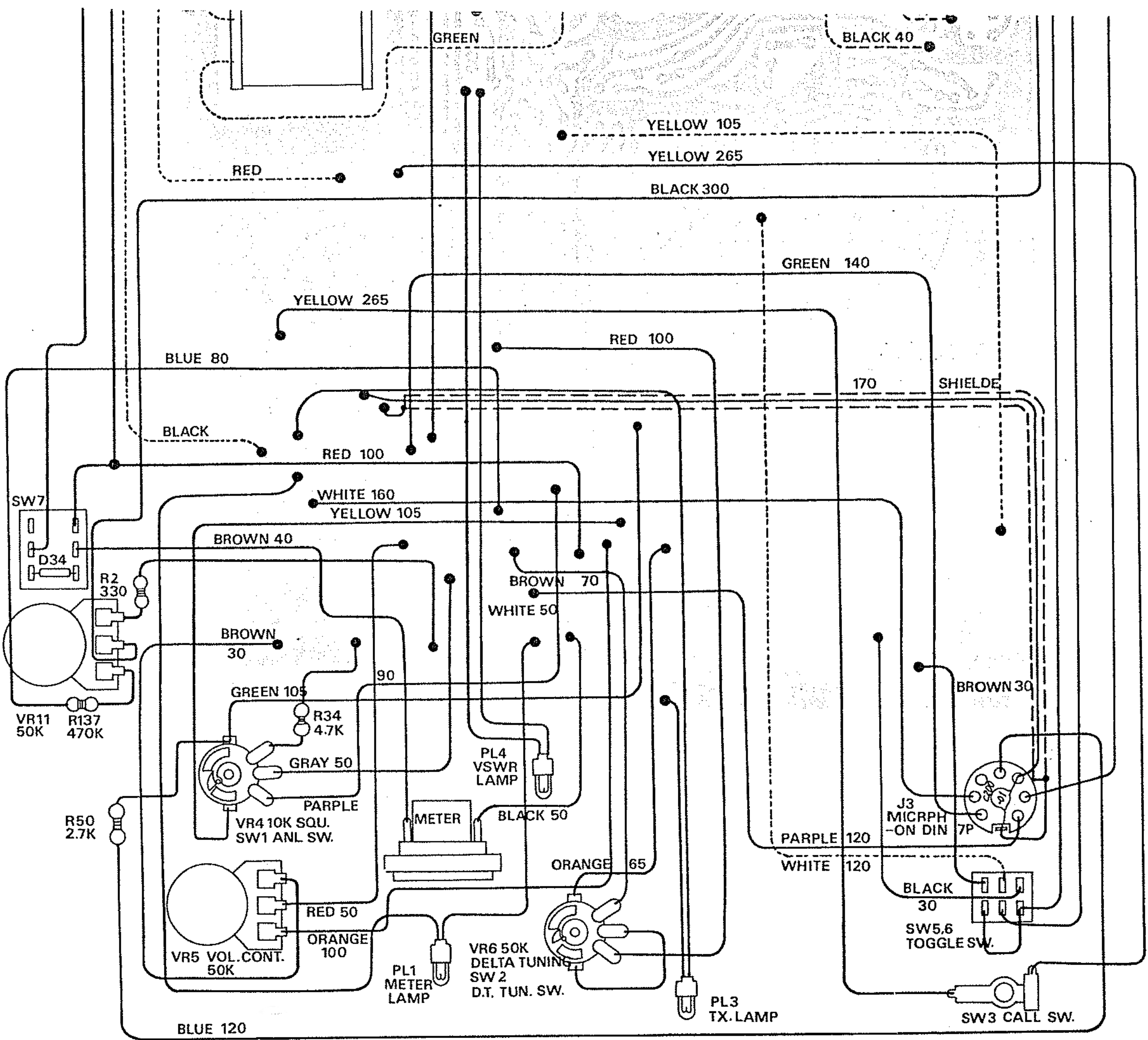






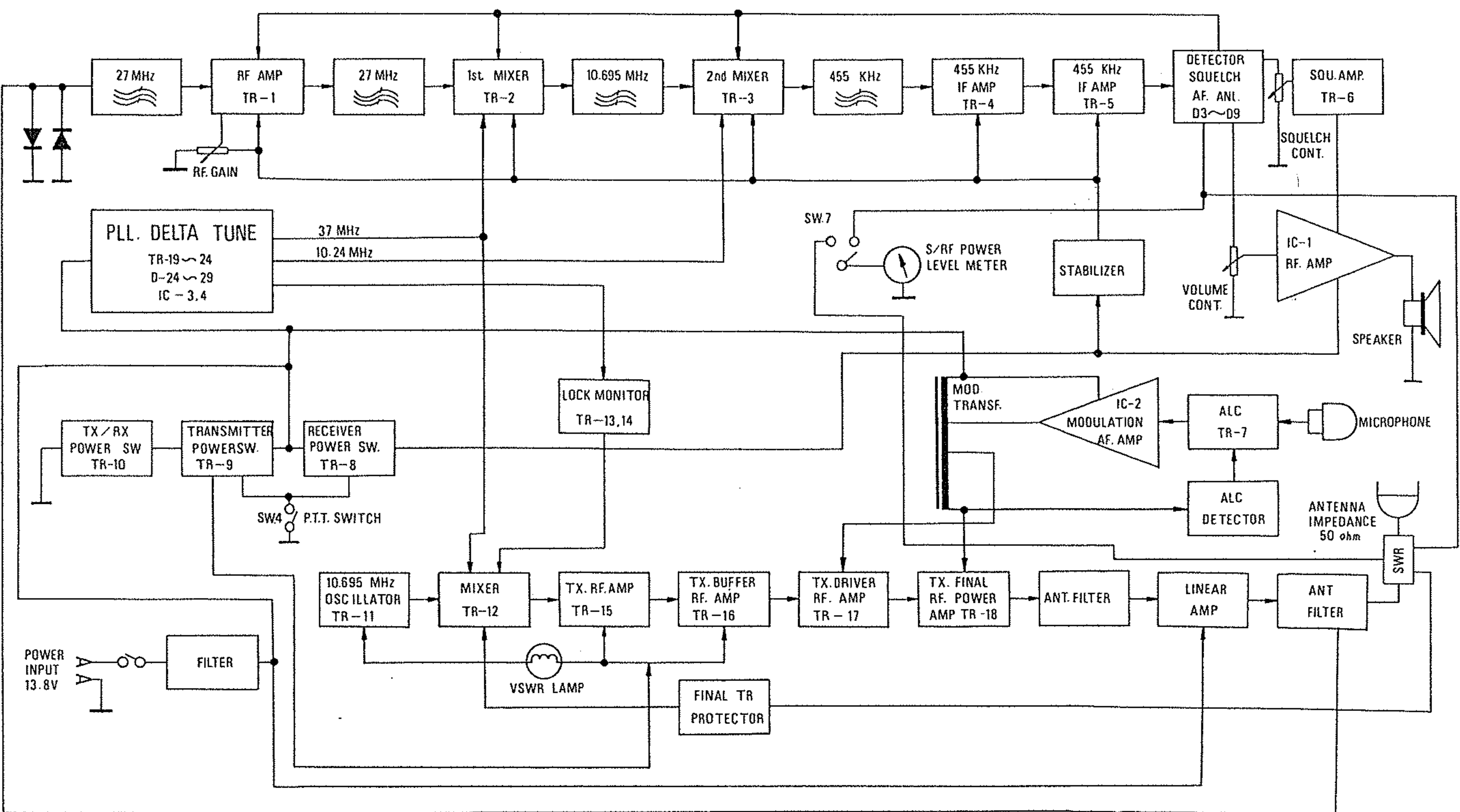


## COMPLETE PARTS LAYOUT





# BLOCK DIAGRAM



## PARTS LIST for TS-680EDX (B)

| DESIGNATION | PARTS NAME                   | PARTS NO. |
|-------------|------------------------------|-----------|
| MP-455      | Front Frame                  | 524405    |
| MP-463      | Chassis Frame                | 522055    |
| MP-456      | Back Pannel                  | 524447    |
| MP-105      | Cabinet Cover (Upper)        | 483016    |
| MP-124      | Cabinet Cover (Lower)        | 514346    |
| MP-107      | Mounting Bracket             | 484085    |
| MP-457      | Booster Chassis              | 523060    |
| MP-458      | Heatsink                     | 523059    |
| MP-522      | Front Plate (R)              | 524392    |
| MP-523      | Front Plate (L)              | 534525    |
| MP-459      | Brand Plate                  | 524443    |
| MP-460      | Back Plate                   | 524444    |
| MP-110      | Mounting Bracket for Meter   | 484064    |
| MP-461      | Heatsink for IC              | 524378    |
| MP-211      | Meter Lamp Reflection Plate  | 484063    |
| MP-111      | Call Switch Contact          | 484086    |
| MP-112      | Call Switch Spring           | 484087    |
| MP-307      | Knob for Squ./Delta. Control | 494199    |
| MP-117      | Knob for Channel Selector    | 484116    |
| MP-17       | Knob for Vol./Swr. Control   | 474011    |
| MP-118      | Nut for Channel Selector     | 484073    |
| MP-120      | Screw for Mounting Bracket   | 484098    |
| MP-356      | Heatsink for 2SC1957         | 494250    |
| MP-19       | Call Button                  | 484057    |
| MP-5        | Mounting Bracket for Speaker | 504335    |
| MP-109      | Supporter for Mic. Consent   | 484084    |
| MP-500      | PLL, Unit Cover (Upper)      | 524376    |
| MP-501      | PLL, Unit Cover (Lower)      | 524386    |
| MP-462      | Booster Chassis Cover        | 524421    |
|             | Heatsink (Small)             | 524385    |
| VC4         | Trimmer Condenser 6PF        | CV05-A060 |
| VC5 1       | Trimmer Condenser 12PF       | CV05-C120 |
| VC5         | Trimmer Condenser 30PF       | CV05-E300 |
| VC2         | Trimmer Condenser ~150PF     | AL-150B   |
| VC3         | Trimmer Condenser ~400PF     | AL-400B   |
| CF1,2       | Ceramic Filter               | CFU455H   |



## PARTS LIST for TS-680EDX (B)

| DESIGNATION  | PARTS NAME                           | PARTS NO.   |
|--|--------------------------------------|-------------|
| IC1  | Integrated Circuit                   | TA-7200     |
| IC2  | Integrated Circuit                   | TA-7205     |
| IC3  | Integrated Circuit                   | TC-9100P    |
| IC4  | Integrated Circuit                   | TBA-120     |
| TR7  | FET                                  | 2SK30       |
| TR1  | FET                                  | 3SK40       |
| TR10   | Transistor                           | 2SC496      |
| TR15   | Transistor                           | 2SA562      |
| TR9  | Transistor                           | 2SA634      |
| TR6, 16  | Transistor                           | 2SC945      |
| TR8  | Transistor                           | 2SC1096     |
| TR2~5, 11~13   | Transistor                           | 2SC1675     |
| TR19   | Transistor                           | 2SC1678     |
| TR21, 24~26  | Transistor                           | 2SC1739     |
| TR22, 23   | Transistor                           | 2SC1741     |
| TR18   | Transistor                           | 2SC1957     |
| TR14   | Transistor                           | 2SC2086     |
| TR17   | SCR                                  | 2SF656      |
| TR20   | MRF                                  | MRF454      |
| D <sup>1~7, 9~12, 16, 18</sup><br>D <sup>22, 23, 26, 32~34</sup> | Silicon Diode                        | IS2473      |
| D13~15, 25   | Silicon Diode                        | 1N4002      |
| D27  | Varicap Diode                        | IS2689      |
| D31  | Varicap Diode                        | IS1658      |
| D28  | Zener Diode                          | WZ-060      |
| D17, 29  | Zener Diode                          | WZ-070      |
| D8, 30   | Zener Diode                          | WZ-090      |
| VR2  | Semi Variable Resistor 10K ohm       | SVR010KS2   |
| VR1, 3   | Semi Variable Resistor 100K ohm      | SVR100KS2   |
| VR8, 10  | Semi Variable Resistor 1K ohm        | SVR001KS3   |
| VR7, 9   | Semi Variable Resistor 100K ohm      | SVR100KS3   |
| VR5  | Variable Resistor (Volume) 50K ohm   | VR1650KB    |
| VR4, SW1   | Variable Resistor (Squelch) 10K ohm  | VI2M4-1S    |
| VR6, SW2   | Variable Resistor (D. Tune) 50K ohm  | VI2M4-1S    |
| VR11, SW7  | Variable Resistor (RF. Gain) 50K ohm | VM13E-JER22 |
| SW5, 6   | Toggle Switch                        | 8A-2021     |
| SW4  | PLL Rotary Switch                    | SRS-303U112 |
| LED  | LED Display                          | GL-6P202    |

## PARTS LIST for TS-680EDX (B)

| DESIGNATION | PARTS NAME                            | PARTS NO.   |
|-------------|---------------------------------------|-------------|
| T1, 16      | RX RF Tuning Coil                     | 089-905     |
| T2, 3       | IFT 10.7 MHz                          | 089-901     |
| T4          | IFT 455 KHz                           | 089-902     |
| T5          | IFT 455 KHz                           | 087-102     |
| T6          | IFT 455 KHz                           | 145-101     |
| T7          | Modulation Trans                      | E1-42       |
| T8          | Power Filter Trans                    | E1-24       |
| T9, 10      | TX Mixer Coil                         | 087-904     |
| T11         | TX 27MHz Filter Coil                  | 231-801     |
| T12         | TX 27MHz Buffer Tuning Coil           | 005-905     |
| T13         | 10.24 MHz OSC Coil                    | 231-002     |
| T14         | PLL VCO Coil                          | 231-001     |
| T15         | VCO AMP Coil                          | 231-003     |
| T17         | TX Final Tuning Coil                  | 005-907     |
| L1, 2       | TX Power Choke Coil                   | 010-907     |
| L3, 8       | TX Final Choke Coil                   | 005-901     |
| L5          | TX $\pi$ Matching Coil                | 145-903     |
| L6          | TX $\pi$ Matching Coil                | 145-902     |
| L7          | Booster Input Coil                    | 280-903     |
| L9          | Booster Base Choke Coil               | 005-903     |
| L10, 14     | Booster Collector Choke Coil          | 089-916     |
| L11         | Booster Output Tuning Coil            | 280-902     |
| L12, 13     | Booster $\pi$ Matching Coil           | 280-901     |
| L15         | DC Input Filter Coil                  | 280-701     |
| L16         | SWR Coil                              | 280-702     |
| J1          | Antenna Jack                          | MRM/INCH    |
| J2          | EXT. Speaker Jack                     | SJ-269      |
| J3          | Microphone Jack Din Type 8P           |             |
| K-1         | Connector 8 pin                       | K8P-780BS-A |
| K-2         | Connector 8 pin                       | K8P-780BS-B |
| R           | Resistor                              | PM7-103K    |
| MIC         | Microphone Complete                   |             |
| F1          | Fuse 10A                              | F-10A       |
| P, C        | Power Cord with Contact & Fuse Holder | 523066      |
| M           | Meter                                 | 510119      |
| SP          | Speaker                               | 77-08       |
| PL1~3       | Pilot Lamp 14V-80mA                   | 524387      |