

MULTI-U11 70CM

# CAUSES FOR TROUBLE AND ADJUSTING POINTS

## ■ Receiving Section

- (1) Extremely low sensitivity . . . . .  
Breaking of core of the coaxial cable and short circuiting
- (2) Frequency aberration . . . . .  
When specific channel only:
  - Aberration in adjustment of the second local OSC trimmer
 When all channels:
  - (a) Aberration in the discrecoil DS 2 (blue core) (Disconnect the antenna and turn the center meter to 0 at the noise condition.)
  - (b) Aberration in adjustment of the first local OSC trimmer (TC9)
- (3) No voice is heard
  - (a) Disconnection in wiring;  
Bad contact in the earphone jack
  - (b) Breakage in the low-frequency amplifier IC 3 AN 214 P
- (4) No transmitting output
  - Protection circuit is operating. It is due to trouble in the antenna system.

## ■ Transmitting Section

- (1) Extremely low power  
Disconnection and short circuit in wiring and coaxial cable  
Bad tuning due to deterioration by aging
- (2) Frequency aberration  
Compensate by the trimmer next to the crystal
- (3) When frequency modulation is not understood
  - (a) Disconnection or short circuit in the microphone cord system
  - (b) Breakage in the modulation (W)/(N) change-over switch

**SCHEMATHEEK**  
Beh. T. Hultermans  
Postbus 4228  
5604 EE Eindhoven

# SPECIFICATIONS

## ■ General Specifications:

Frequency range for transmission and reception: 430 ~ 450 MHz  
(Already preset at the amateur band for in your area.)

No. of channels: 23 channels + 4 SCAN + VFO channel

Selection method: Fixed and VFO channel  
Rotary switch selection  
SCAN channel . . . Automatic and manual

SCAN Speed: 4 channel/second

Voltage at Power Source: DC 13.5V operation voltage  
11 - 15V minus grounding

Current consumption:  
At transmission (H1) about 2.5A  
(Low) about 1.3A  
At reception (Max.) about 0.6A  
(No Signal) about 0.3A

Semiconductor used: Tr 44, FET 1, IC 3, D 49, SCR 1, LED 5

Measurement: Width 163 mm  
Height 56 mm  
Depth 230 mm (except projections)

Weight: about 2 kg

## ■ Transmitting Section

Wave type: F3  
Transmitting output: Hi 10 W Low about 1 W

Modulation method: Vector synthetic phase modulation

Maximum frequency deviation:  
Wide 15 KHz  
Narrow 5 KHz

No. of doubling: 24

Unnecessary radiation strength: less than - 60 dB

Antenna Impedance: 50 Ω

Microphone: Dynamic type 500 Ω

## ■ Receiving Section

Wave type: F<sub>3</sub>

Receiving method: Triple super heterodyne

Intermediate frequency:  
No. 1 IF 45 MHz  
No. 2 IF 10.7 MHz  
No. 3 IF 455 KHz

Sensitivity: Less than 0.5μV (20dB NO)

Squelch sensitivity: Less than 0.5μV

Selectivity: Wide 12 KHz Min. (-6 dB)  
20 KHz max. (-60 dB)  
Narrow 7 KHz Min. (-6 dB)  
12 KHz max. (-60 dB)

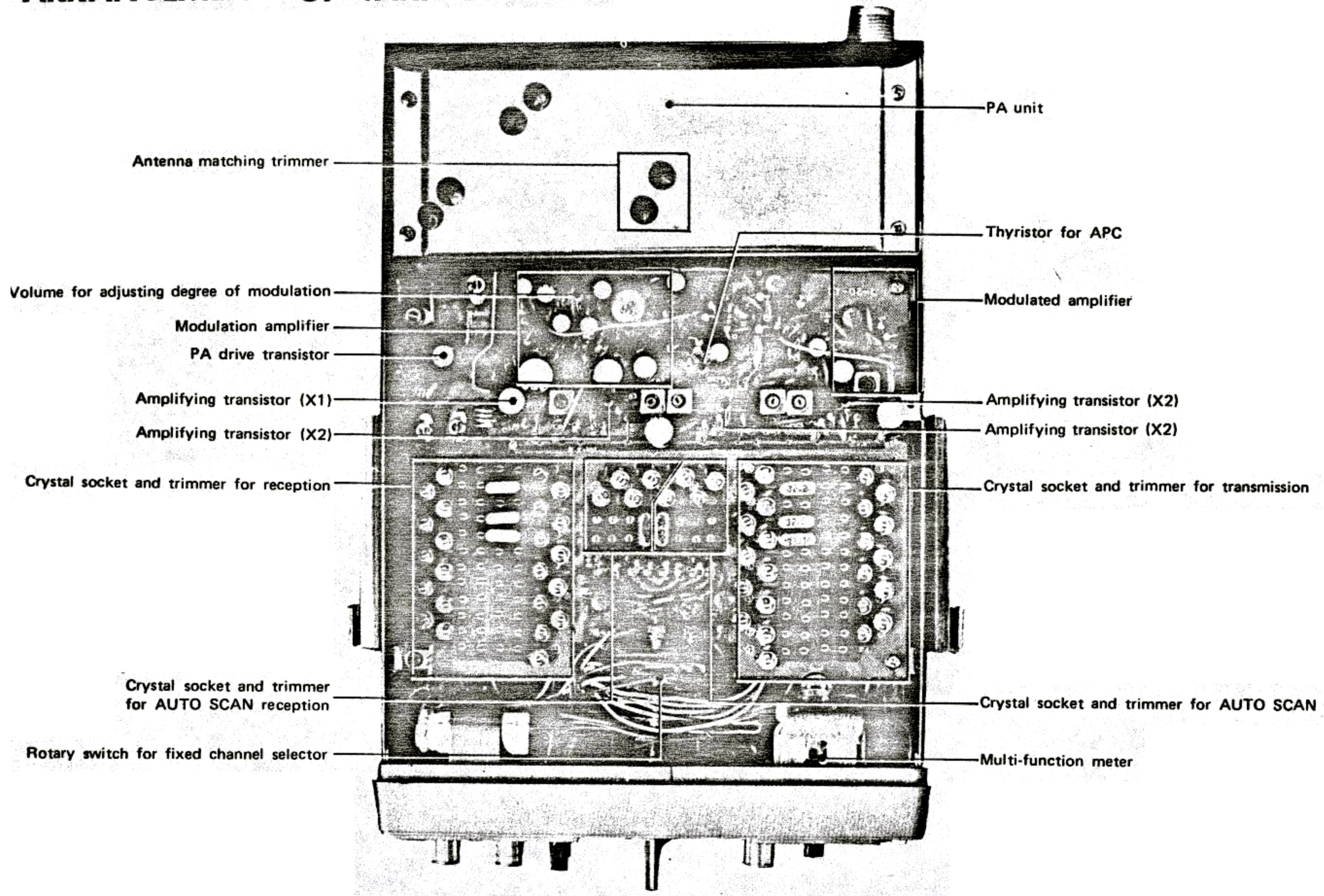
Image ratio: 60 dB Min.

Receiving spurious: 60 dB Min.

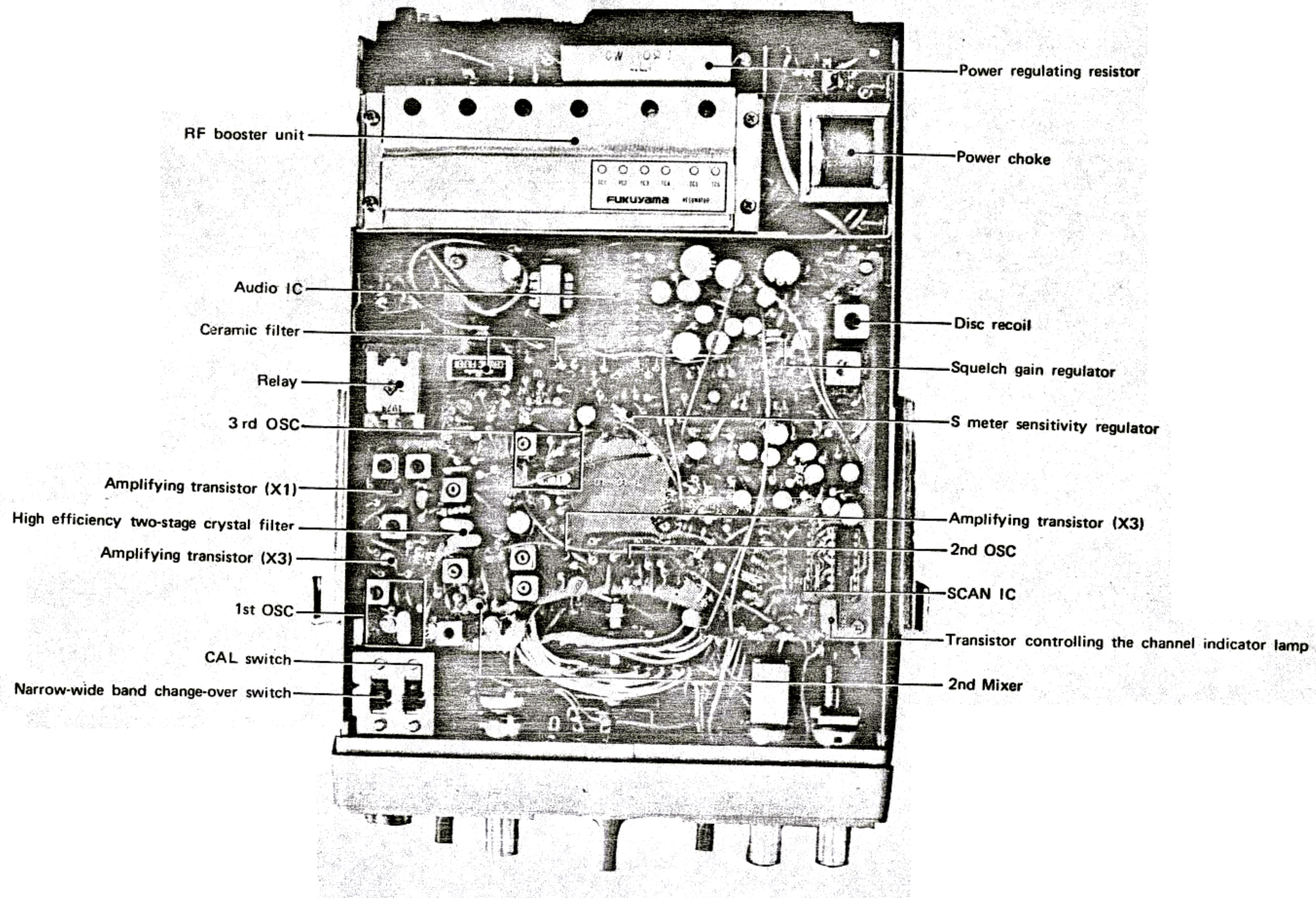
No. of doubling the 1st local OSC: 9

Low frequency output: 3 W (10% staggering at 4Ω load)

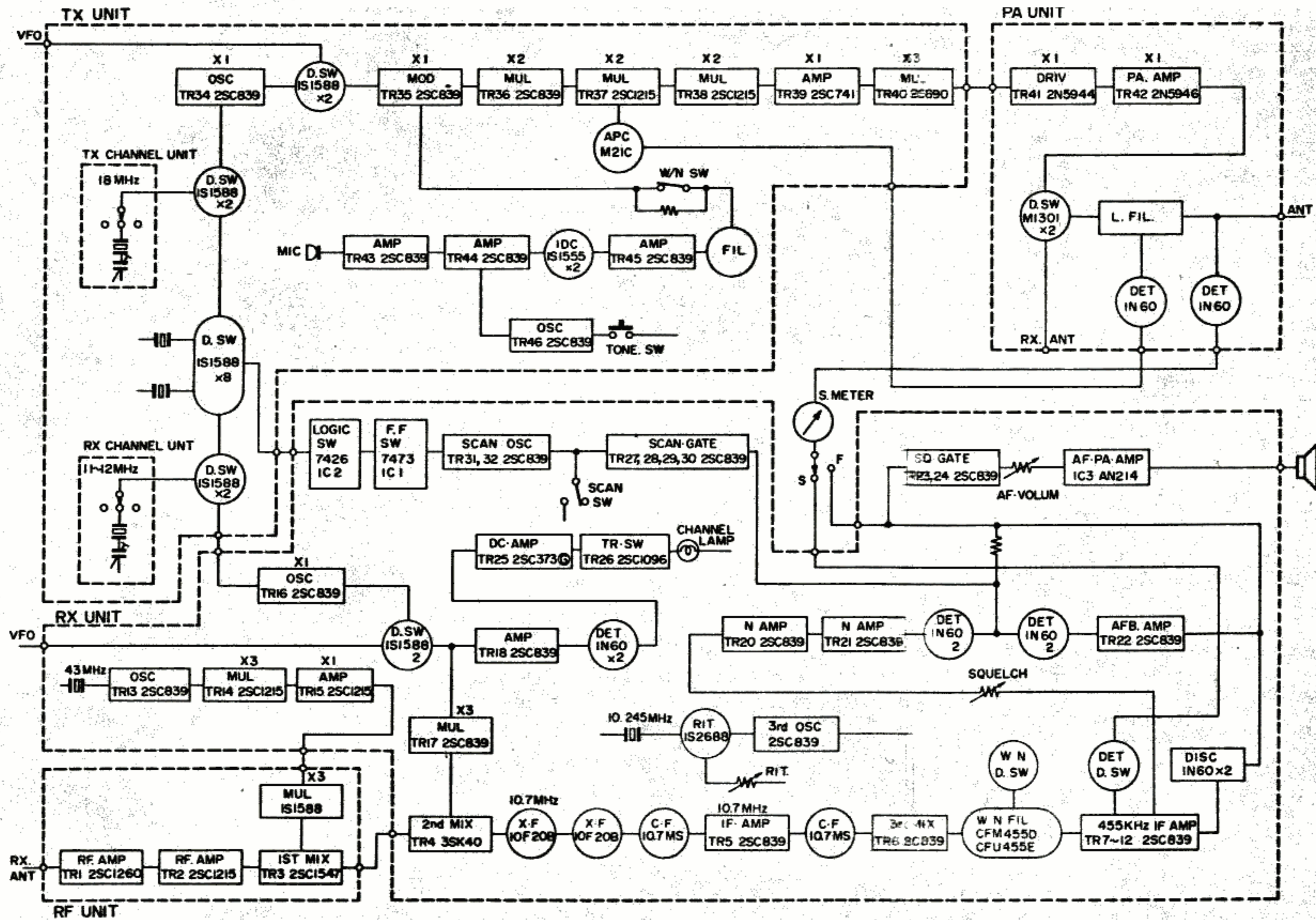
# ARRANGEMENT OF VARIOUS PARTS

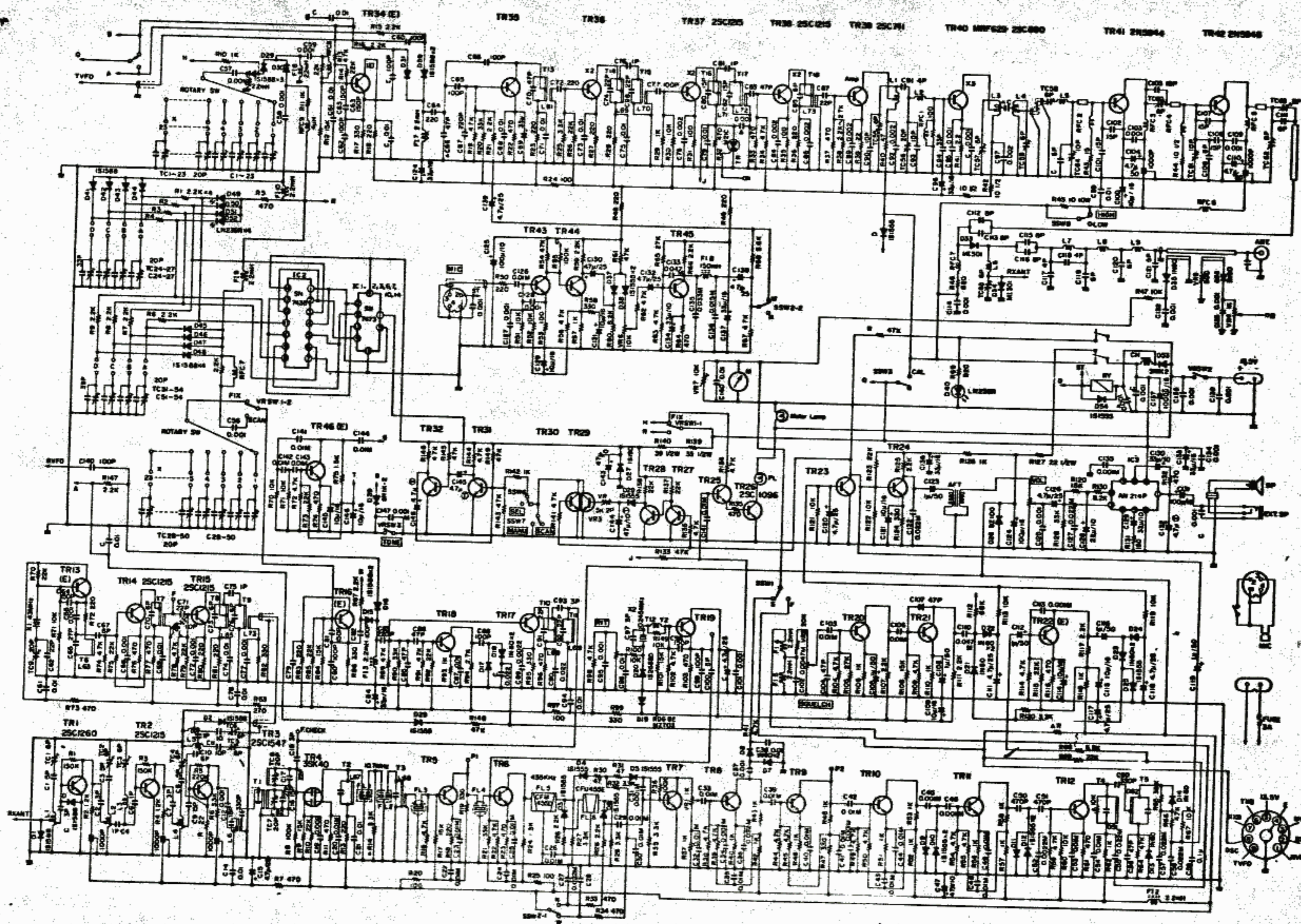


# ARRANGEMENT OF VARIOUS PARTS



# BLOCK DIAGRAM





• NO MARKED TRANSISTORS ARE 2SC839.

\* Schematic Diagram and Specifications are subject to change without prior notice.

#### 15. Meter Change-over Switch

This switch is for changing-over the function of the Function Meter on the front panel.

Ordinarily, it is used, at the S position, as S meter. When it is slid to the F side, it functions as center meter, gauging F difference of the fellow station.

#### 16. Outside Speaker Terminal

When using an outside speaker, draw out this terminal, using the attached earphone jack (3.5  $\phi$ ).

#### 17. Power Source Connector

This connector is for supplying DC 13.5V power. Use the attached DC cord.

#### 18. AUX Terminal

Use the AUX Terminal for connecting the external VFO, etc., with the main set. The terminals are arranged in order counter-clock-wise from 1 - 9, as seen from the outside:

- No. 1 VFO terminal for receiving
- No. 2 Standby switch
- No. 3 Microphone connector terminal
- No. 4 Earth terminal
- No. 5 B + (13.5V) output
- No. 6 B + transmission output terminal at transmitting
- No. 7 B + output at receiving
- No. 8 DISC output (to external VFO)
- No. 9 VFO terminal for transmitting

#### 19. CAL Switch

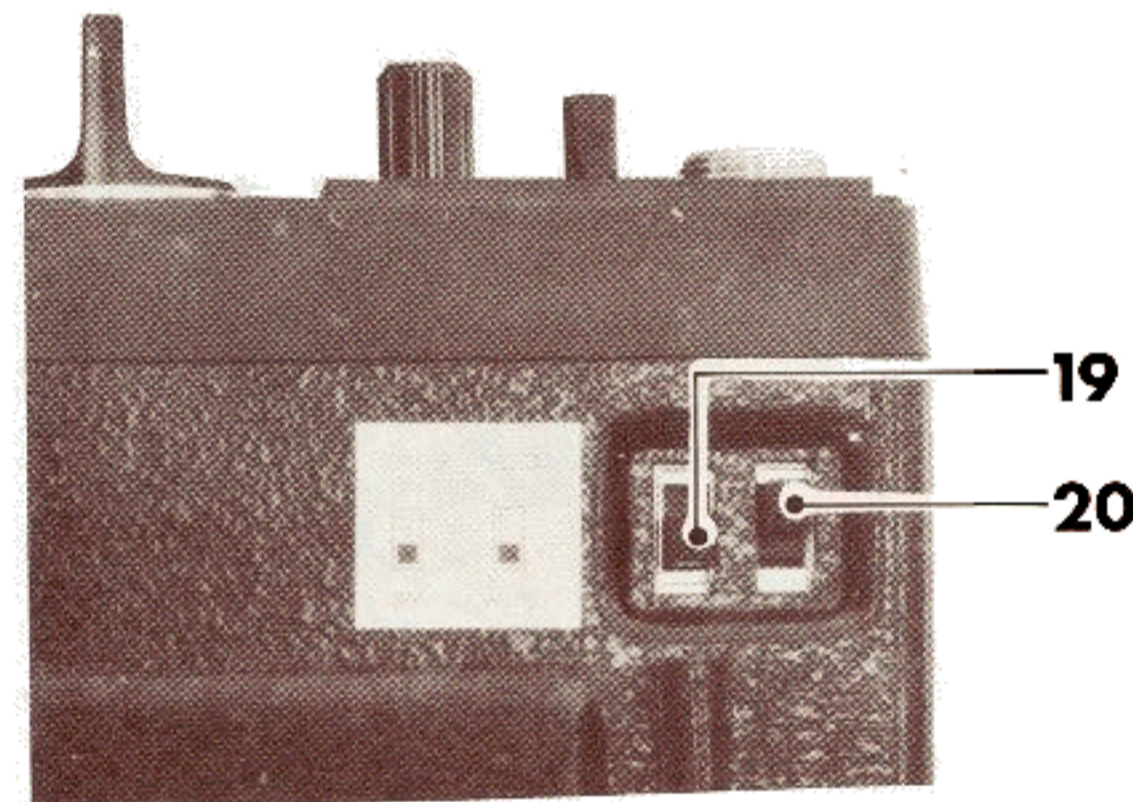
Use the CAL Switch for adjusting the transmission frequency when installing additional crystals or new settings.

#### 20. FM (W)/FM (N) Change-over Switch

This is the revolutionary switch, enabling the change-over of transmitting and receiving bands.

Ordinarily, FM(W) is used in line with the 30-40 KHz separation. However, as stations using 15-25 KHz separation have increased, changing-over to the narrow-band-FM(N) results in narrowing the band (15-25 KHz), thus taking away the cause for giving or receiving interference to or from the adjacent channels.

Since the change-over to FM(N) results in a narrow band and sometimes bring about lower receiving sensitivity depending on the degree of frequency difference. Correct tuning should be made by the RIT/TONE Switch. Moreover, when receiving the FM(W) station with the FM(N), voice will become distorted. But this phenomena is not due to trouble but rather to the band having become narrow.



# METHOD OF INSTALLATION AND HOOK-UP OF VARIOUS PARTS

## ■ When Mounting on the Car

Safety first! Safe driving should be the matter of concern for all drivers and radio fans as well.

### 1. Place of Mounting

Since the layout inside the car differs from each other, only general instances will be given. FB is under the dash board (glove compartment and under tray) on the opposite side of the driver's seat. Be careful with the high temperature inside the car under the direct rays of the sun.

### 2. Mounting Method (Fig. 2)

Be careful with the earth for the car body. Since the multi-11 is of  $\ominus$  earth, the angle must be insulated from the car body when mounting on the car with the  $\oplus$  earth. First, fit the angle for mounting securely with bolts, nuts, washers, etc. Next, place the set onto the rail and push it in deeply, clamp it at the convenient angle for use, and then fix it tightly with the hanger screw.

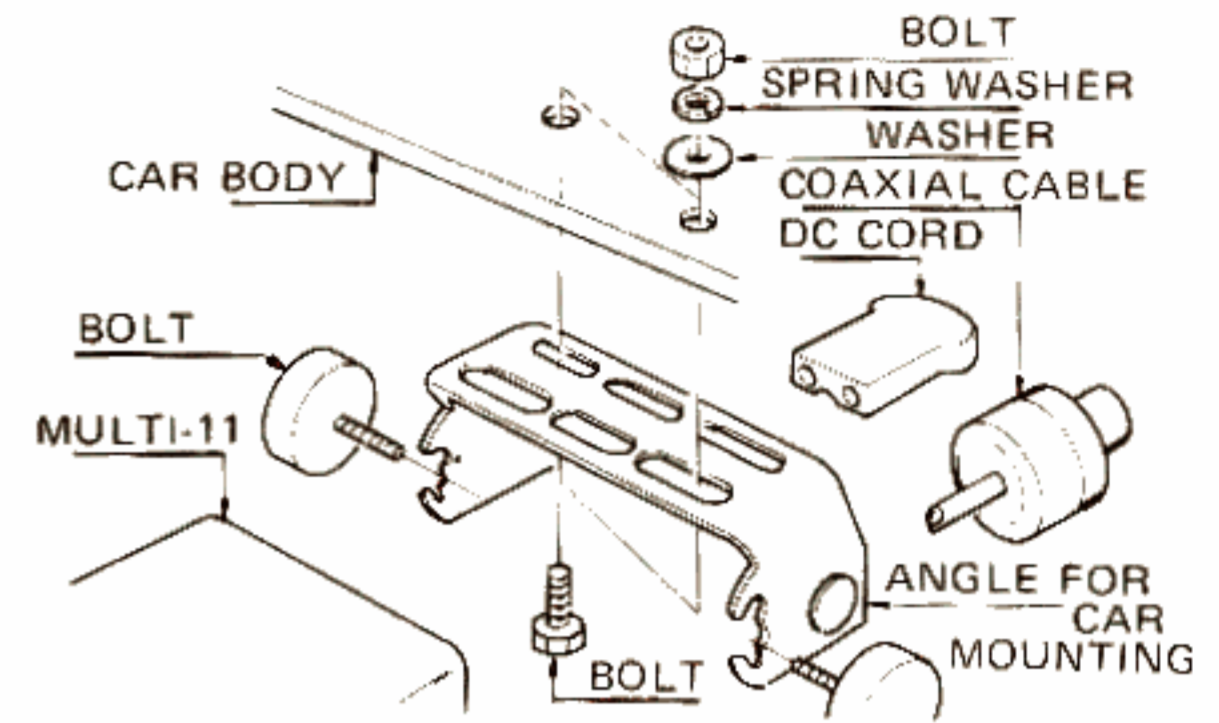


Fig. 2 Mounting method

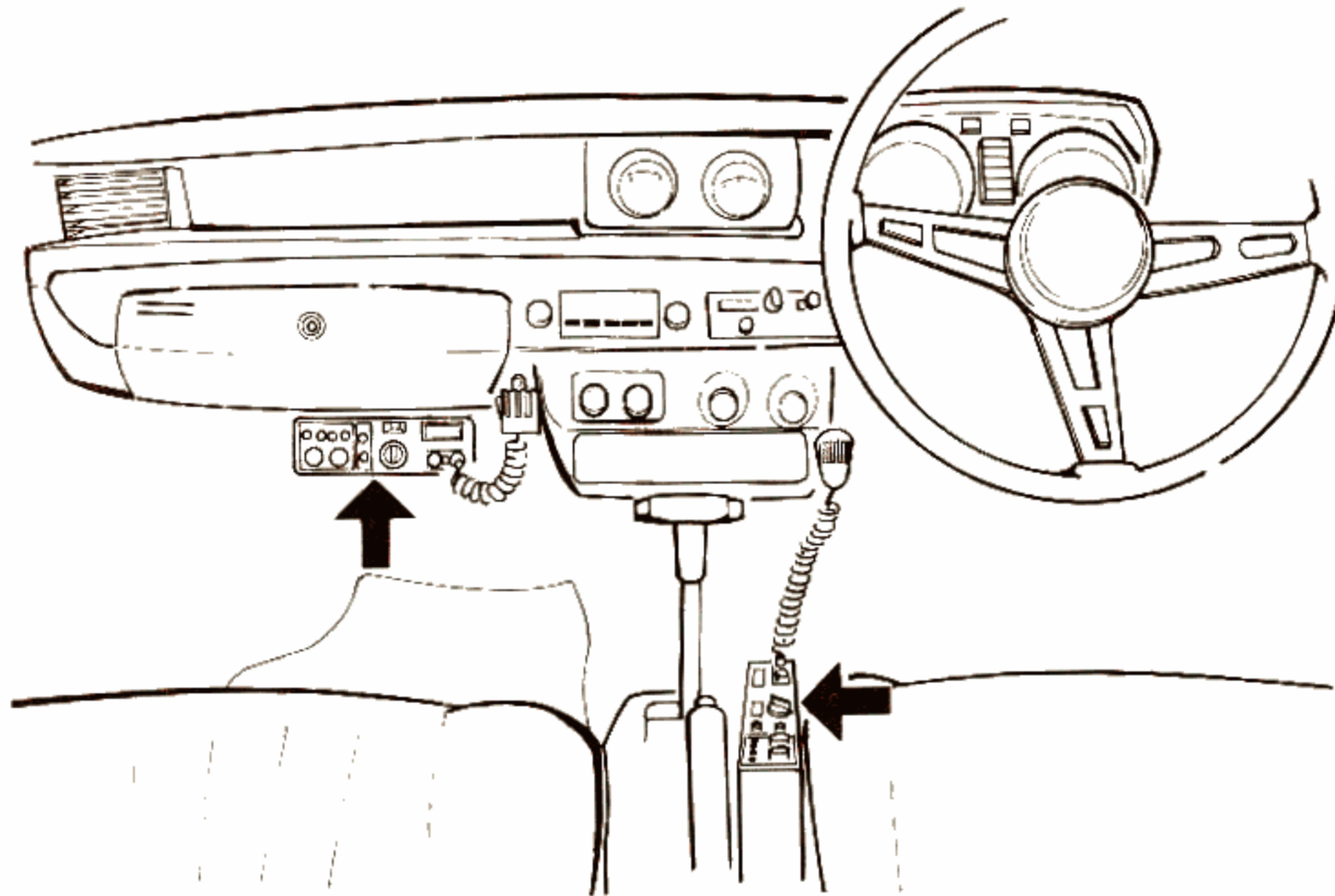


Fig. 1 An example showing mounting position

### 3. Setting up the Antenna (Fig. 3)

The antenna impedance for MULTI-11 is designed at  $50\Omega$ . So, use the coaxial cable having the same  $50\Omega$  impedance. Fit the antenna securely as it is constantly exposed to wind pressure so that no play appear during its use. When fixing with the use of bolts and nuts, apply sealing compound onto the screw parts, thus preventing play as well as rusting. Loss is held to the minimum when the coaxial cable is wired as short as possible.

### 4. Adjustment of Antenna

The antenna should be adjusted in accordance with handling explanations and the like for the sake of an efficient wave radiation.

### 5. Connection of the Power Cord (Fig. 4)

Use the attached power cord. Hook the red lead on the  $\oplus$  pole on the battery and the black lead on the  $\ominus$  pole (for the  $\ominus$  earth cars). Fix the wires securely so that they do not dangle. Moreover, either avoid wiring in so far as possible, places that are liable to cause abrasion or breakage or protect them by taping.