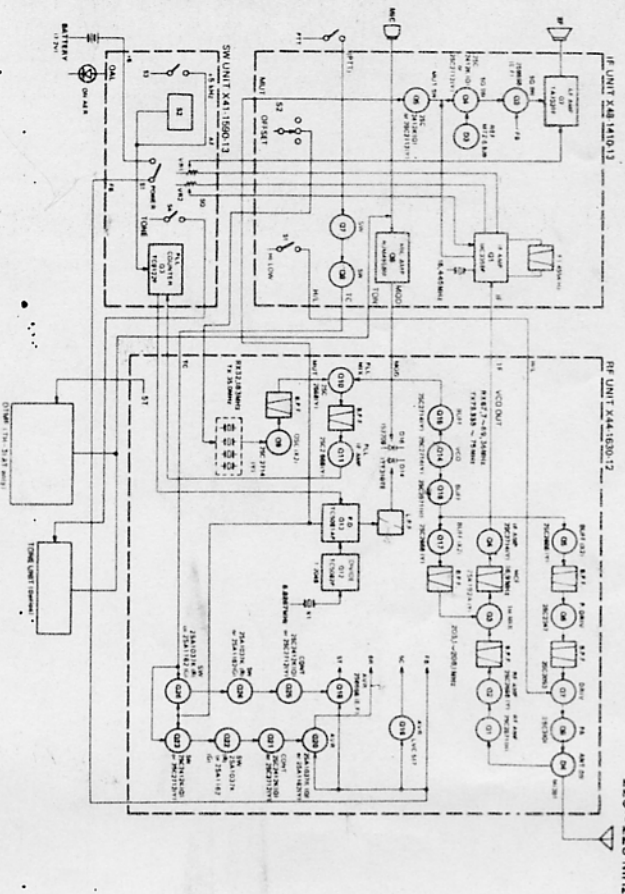


Optional Accessories

The following optional accessories are available for the TH-31A/AT.

- ① Rechargeable Ni-Cd battery pack PB-21
 - ② Manganese battery case BT-2
 - ③ SUM-2 battery case (for extended operation) EB-2
 - ④ DC-DC power supply (for mobile operation) DC-21
 - ⑤ External speaker/microphone SMC-30
 - ⑥ Headset with VOX HMC-1
 - ⑦ Soft carrying case SC-8
 - ⑧ Earphone HS-8
 - ⑨ Antenna conversion plug (twist lock to BNC) AJ-3
 - ⑩ Tone unit TU-6
- BLOCK DIAGRAM**



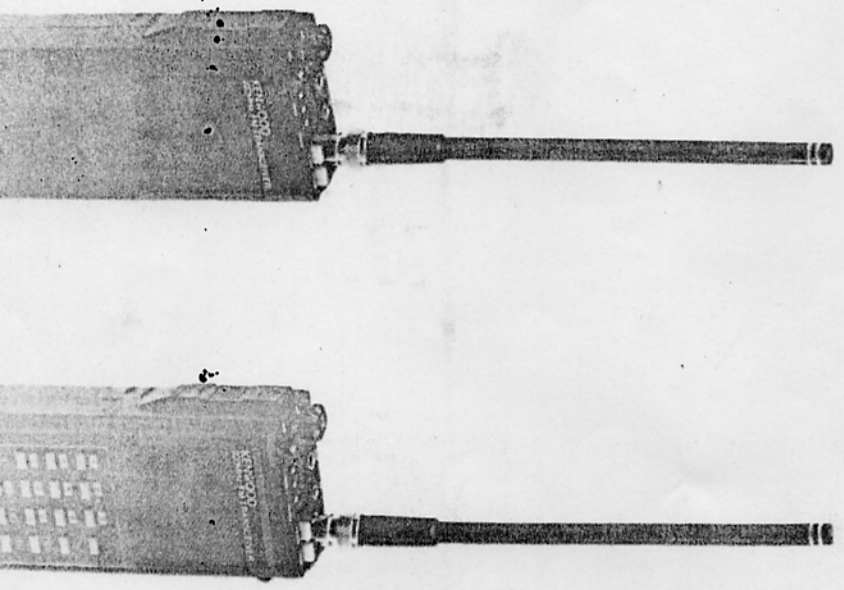
TRIO-KENWOOD CORPORATION
 57000 Shovel Building, 115 Adams Street, Channahon, Illinois 61510, U.S.A.
 TRIO-KENWOOD COMMUNICATIONS
 1111 West Walnut Street, Compton, California 90220, U.S.A.
 TRIO-KENWOOD COMMUNICATIONS
 DANISCH OF TRIO-KENWOOD ELECTRONICS GmbH
 TRIO-KENWOOD ELECTRONICS NV

KENWOOD

TH-31A/AT

220MHz FM TRANSCEIVER

Instruction Manual



Accessories

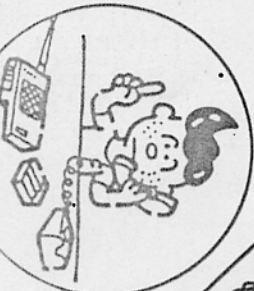
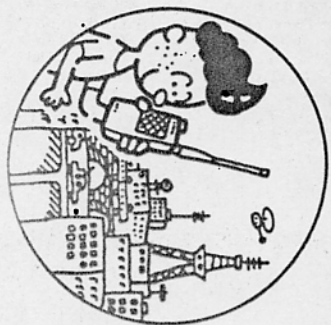
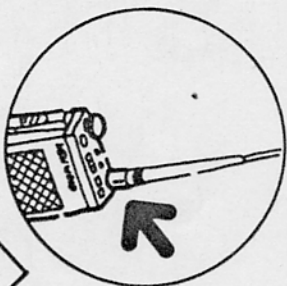
Confirm that the accessories shown below are included.

Helical antenna.....	1
Ni-Cd battery pack.....	1
Battery charger.....	1
Earphone.....	1
Hand strap.....	1
Instruction Manual.....	1
Warranty card (For users in USA only).....	1

The carton box and packing materials should be retained for future transportation.

Before operation

- Ensure the supplied helical antenna is securely tightened.
- The trimmers and cores inside the unit are factory adjusted. Do not touch them.
- Should the unit require service, contact your authorized dealer.



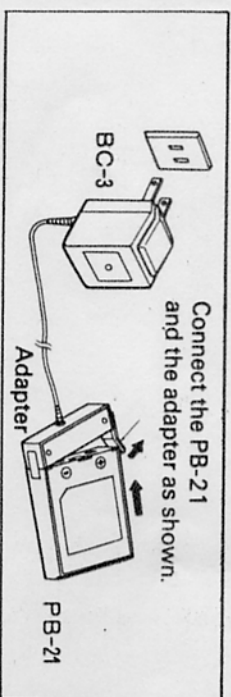
Battery notes

1. Recharging the battery pack

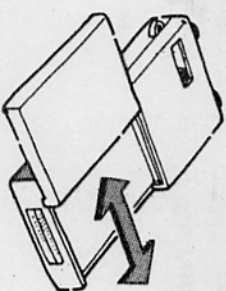
- Plug the BC-3 into the AC line outlet and connect the adapter to the PB-21 battery pack. Observe polarities. While recharging is in progress, the red LED on the BC-3 will light. The LED will remain lit while the BC-3 is connected to the AC line outlet. To avoid overcharging, unplug the BC-3 after approximately 8 hours of recharging.

Notes:

1. Recharging should be done at an ambient temperature between 10°C and 40°C. If recharging is performed outside of this range, the battery pack may not fully charge.
2. Excessive charging will adversely affect the battery performance.



- Align the grooves in the battery case and unit and slide the battery case to the right. Slide to the left to remove the battery case.



2. Operation time with AAA batteries

The operation time with a repeated 1 minute TX and 3 minute RX cycle is approximately 40 minutes with manganese batteries and about 90 minutes with alkaline manganese batteries.

To communicate over a short distance, set the H/Low switch to

LOW to conserve power and thus extend operation time. When the batteries are exhausted and the H/Low switch is set to LOW, the

Operation

1. Reception

- Turn the VOL control to the right to supply power, and adjust the volume control to the desired level.
- Adjust the squelch control clockwise until the background noise just quiets.
- Adjust the frequency switches to the desired receive frequency.

2. Transmission

- Select the desired transmit offset.
- Check to see that the frequency is not busy.
- Press the PTT switch and speak into the microphone. The ON AIR indicator will light.

Note: The distance between the microphone and your mouth should be approximately 5 - 10 cm.



DTMF Key Pad Operation (TH-31AT only)

1. To operate the keyboard as a DTMF key pad press the PTT switch and dial the desired number.
2. After the first number has been entered the radio will remain keyed for

Specifications

General

- Frequency range : 220 MHz - 225 MHz
- Signal type : F3 (FM)
- Operating temperature : -20°C ~ +50°C
- Antenna impedance : 50Ω
- Power supply voltage : 5.8V - 10.0V (rating voltage: 7.2V)
- Power consumption : At reception standby: Less than 30 mA
At transmission (Hi): Less than 650 mA

Dimensions

- (W) 57 (65.5) x (H) 120 (127.5) x (D) 28 (32) mm
- (Low): About 350 mA

The numbers in the parenthesis include projections.

Weight

- : Approx. 280 g (including antenna and Ni-Cd batteries)

Transmitter section

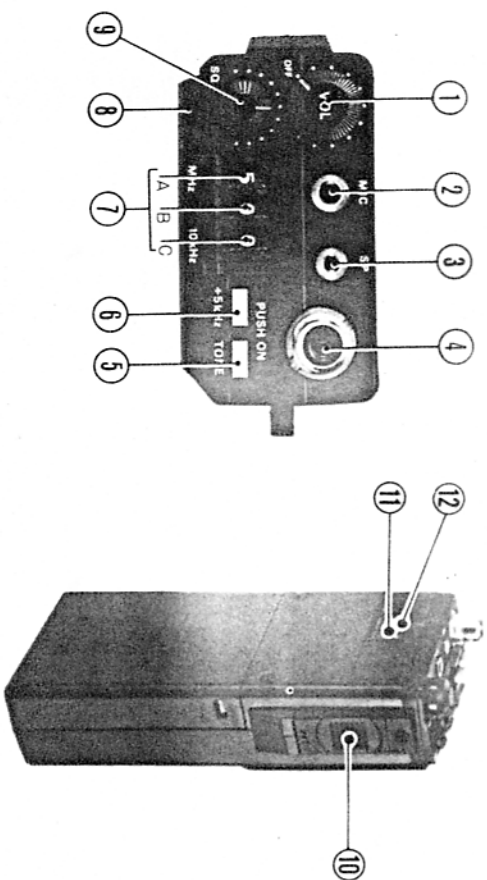
- Output power : Hi: 1.0W, Low: approx. 150 mW
- Modulation system : Reactance modulation
- Max. frequency deviation: ± 5 KHz
- Unwanted reflection : Less than -60 dB
- Microphone : Condenser type

Receiver section

- Reception system : Double superheterodyne
- Intermediate frequency : 1st: 16.9 MHz, 2nd: 455 kHz
- Sensitivity : S/N more than 28 dB at -6dBμ (0.5 μV) input
12dB SINAD; less than -12 dBμ (0.25 μV)
- Squelch sensitivity : Less than 0.2 μV
- Selectivity : -6 dB at more than 12 kHz
-40 dB at less than 28 kHz
- AF output : More than 250 mW (8Ω load, distortion, 10%)

Design and specifications subject to change without notice.

Names and Functions



- ① **VOL control (Volume control/power switch)**
 - This knob is dual-purpose; power switch and volume control.
 - When this knob is turned clockwise, power is supplied.
 - When this knob is further rotated, the volume level increases.
- ② **MIC jack (Microphone jack)**
 - Used in combination with the SP jack, for connection of the optional speaker/microphone (SMC-30) or headset with VOX (HMC-1).

Do not use microphones other than the SMC-30 and the HMC-1, or damage of the transceiver may result. (Because of the DC voltage that is present at the plug.)

 - When the plug is inserted in this jack, the built-in microphone is automatically disconnected.
- ③ **SP jack (Speaker jack)**
 - Connect an external speaker or earphone.
 - Used with the MIC jack, for optional SMC-30 or HMC-1.
 - When the plug is inserted in this jack, the built-in speaker is automatically disconnected.
- ④ **Antenna connector**

- ⑤ **Tone switch**
 - Activates the optional TU-6 (TH-31A/AT).
- ⑥ **+5 kHz switch**
 - When the switch is ON the operating frequency is 5 kHz higher than indicated by the thumb wheel switches.
- ⑦ **Frequency setting switches (Thumb wheel switches)**
 - A..... Used to set to 1 MHz.
 - B..... Used to set to 100 kHz.
 - C..... Used to set to 10 kHz.
- ⑧ **ON AIR indicator**
 - Lights for transmission.
 - When this indicator lights dimly, replace the batteries with new ones.
- ⑨ **SO control (Squelch control)**
 - Used to eliminate noise at non-signal condition. For normal operation, turn the knob clockwise to the point at which noise just disappears.
- ⑩ **PTT switch (Press-To-Talk switch)**
 - Press this switch and speak into the microphone for transmission.
 - The microphone is built in the same place as the speaker.
- ⑪ **Hi/Low switch**
 - Used to adjust the transmission output.
 - At Hi position, the output power is 1 W. At Low position, the output power is about 150 mW.
- ⑫ **TX offset switch**

Shifts the transmit frequency for repeater operation.

"S" Simplex (receive and transmit frequencies are the same).

"REV" Sets the receive frequency 1.6 MHz lower than the frequency set by the thumb wheel switches.

Switches the transmit frequency down 1.6 MHz from the receive frequency.

⑧ Antenna conversion plug (twist lock to BNC)

AJ-3

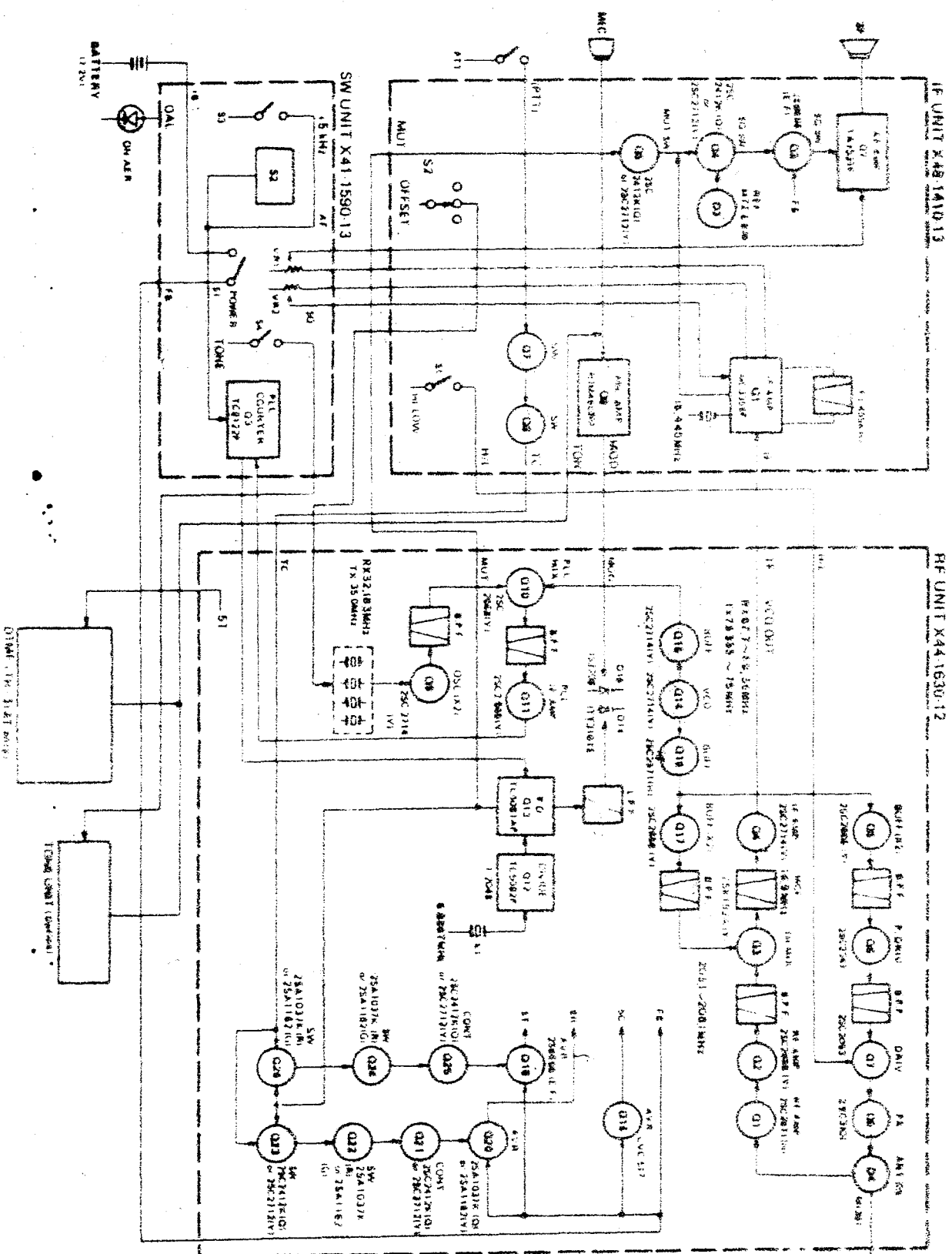
⑨ Tone unit

TU-6

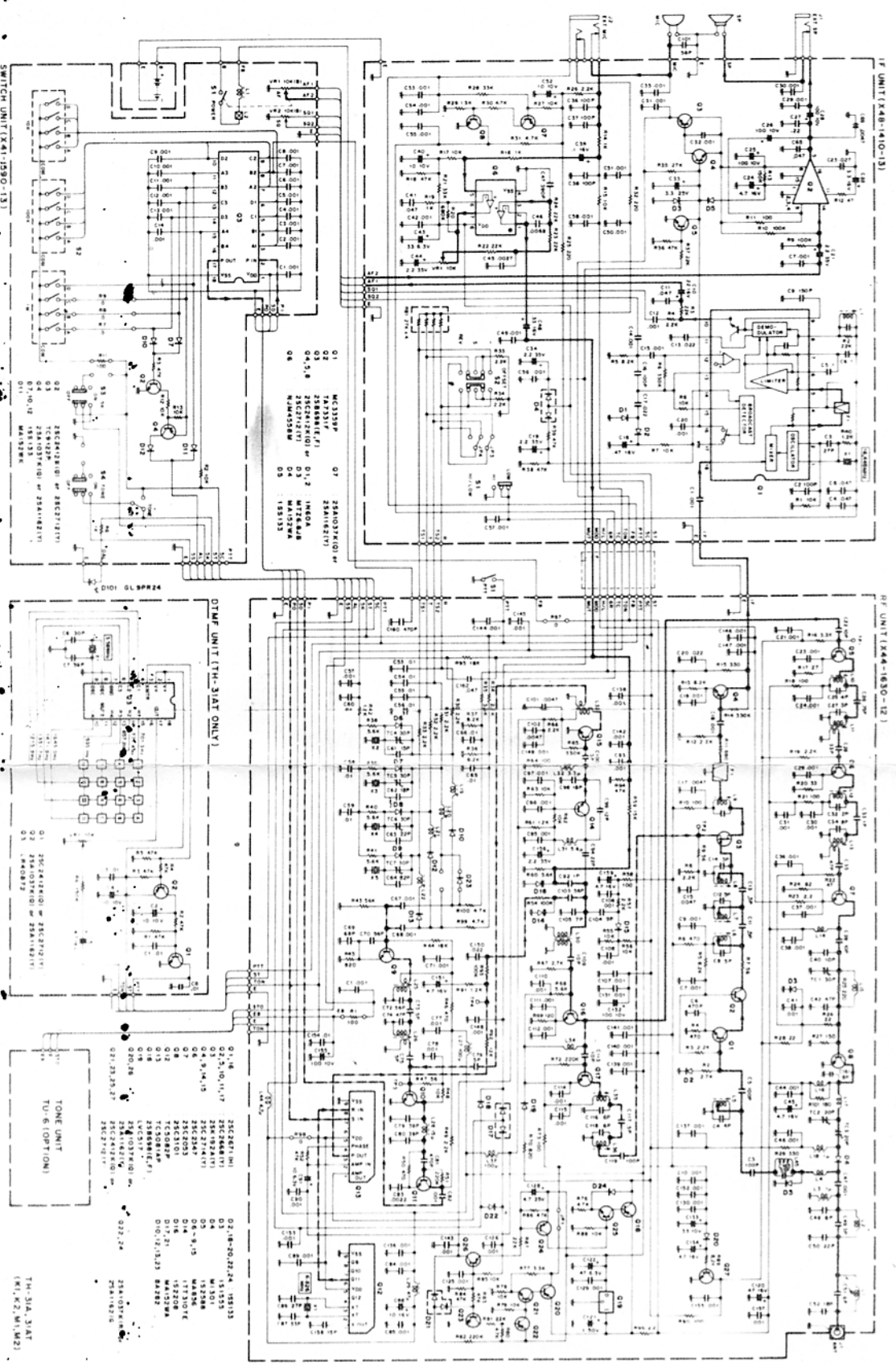
BLOCK DIAGRAM

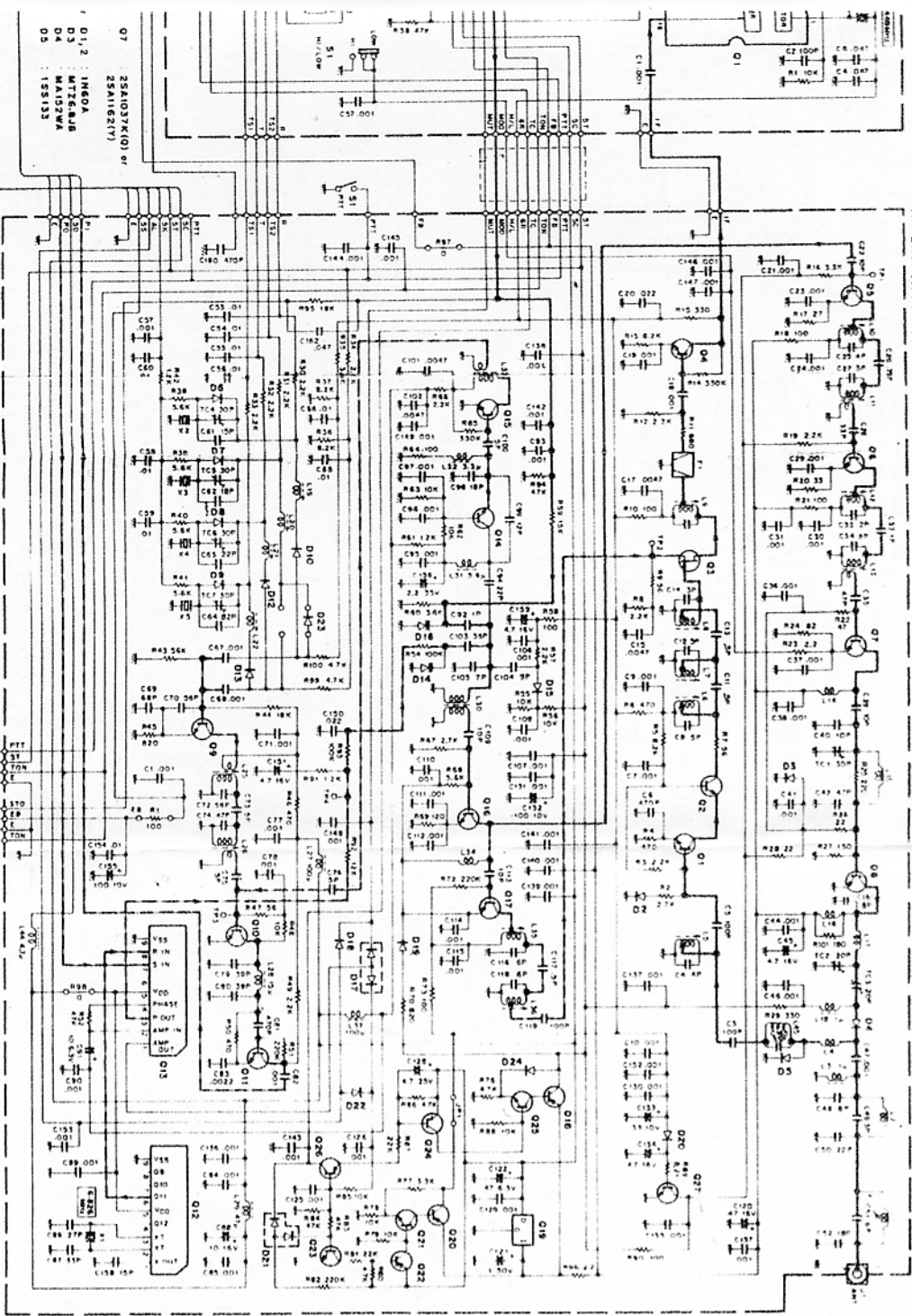
220 ~ 225 MHz

ANT



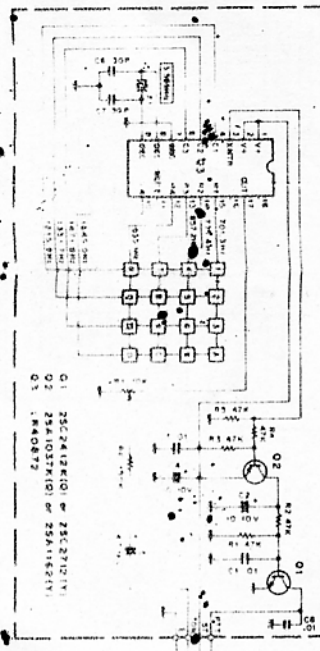
TH-31 SCHEMATIC DIAGRAM





Q7 25A1037K10 or 25A116271
 Q1,2 1N60A
 D1 MITSUBA
 D2 MAJ55WA
 D5 15S133

DTMF UNIT (TH-31AT ONLY)



25A101 25C27121V1
 25A101 25A116271V1
 25A101 25A116271V1

TO NE UNIT
 TU-6 (OPTION)



TH-31A, 31AT
 (K1, K2, M1, M2)

- | | | | |
|---------------|------------|----------------|--------|
| 01,16 | 25C2871M1 | 02,18-20,22,24 | 15S133 |
| 02,3,10,11,17 | 25C28681V1 | 03 | 151035 |
| 03 | 25R19224V1 | 04 | M1301 |
| 04,9,14,15 | 25C27141V1 | 05 | 15Z584 |
| 05 | 25C27141V1 | 06 | 15Z584 |
| 06 | 25C27141V1 | 07 | 15Z584 |
| 07 | 25C27141V1 | 08 | 15Z584 |
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