

KENWOOD

VHF FM TRANSCEIVER

TH-215A
TH-215E

INSTRUCTION MANUAL

KENWOOD CORPORATION



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88/6 5 4 3 2 1 87/12 11 10 9 8 7 6 5 4 3 2 1

Thank you for purchasing the new TH-215A/215E transceiver.

IMPORTANT

Please read this instruction manual carefully before placing your transceiver in service.

This Instruction Manual covers the following models:

- KENWOOD TH-215A: 144 MHz FM transceiver with DTMF.
- KENWOOD TH-215E: 144 MHz FM transceiver with Tone.
- KENWOOD TH-215E: 144 MHz FM transceiver (U.K. version) with Tone Burst.

SAVE THIS INSTRUCTION MANUAL.

Under normal circumstances, the transceiver will operate in accordance with these operating instructions. All adjustable trimmers and coils in your transceiver were preset at the factory and should only be readjusted by a qualified technician with proper test equipment.

Attempting service or alignment without factory authorization can void the transceiver's warranty.

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SPECIFICATIONS

GENERAL	FREQUENCY RANGE		TH-215A (U.S.A. Version) 144.000 ~ 147.995 MHz TH-215A 144.000 ~ 147.995 MHz TH-215E 144.000 ~ 145.995 MHz
	MODE		F3 (FM)
	OPERATING TEMPERATURE		-20°C ~ +50°C (-4°F ~ 122°F)
	ANTENNA IMPEDANCE		50 Ω
	POWER REQUIREMENT	BATTERY PACK	6.3 V ~ 15 VDC (8.4 VDC nominal)
		DC IN	7.2 V ~ 16 VDC
	CURRENT DRAIN	Hi TRANSMIT MODE 2.5 W	Approx. 1 A (8.4 V)
		Hi TRANSMIT MODE 5 W	Less than 1.7 A (13.8 V)
		Low TRANSMIT MODE	Less than 0.7 A
		RECEIVE MODE WITH NO SIGNAL	Approx. 50 mA
		BATTERY SAVER MODE (At 1 : 2)	Approx. 20 mA
	DIMENSIONS (mm)	W x H x D	67 x 173 x 37
		(PROJECTIONS INCLUDED)	69.5 x 180.5 x 40
WEIGHT		Approx. 520 g (With manganese battery and antenna) Approx. 540 g (With Ni-Cd battery and antenna)	
TRANSMITTER	OUTPUT POWER	Hi	5 W (13.8 VDC) 5 W (with PB-1) 2.5 W (with PB-2) 1.5 W (with PB-3, PB-4)
		Low	Approx. 500 mW
		MODULATION	
	MAXIMUM FREQUENCY DEVIATION		± 5 kHz
	SPURIOUS RADIATION		Less than -60 dB
	INCLUDED MICROPHONE		Capacitor type
	CIRCUITRY		DOUBLE CONVERSION SUPERHETERODYNE
RECEIVER	INTERMEDIATE FREQUENCY	1st IF	16.3 MHz
		2nd IF	455 kHz
	SENSITIVITY	12 dB SINAD	Less than 0.2 μV
		S+N/N	More than 28 dB (At 0.5 μV input)
	SQUELCH SENSITIVITY		Less than 0.1 μV
	SELECTIVITY	-6 dB	More than 12 kHz
		-40 dB	Less than 24 kHz
AUDIO OUTPUT POWER		More than 400 mW (across 8 Ω load 10% distortion)	

NOTE: Circuit and ratings are subject to change without notice, due to development in technology.

141.000 → 162.995

ACCESSORIES

Unpack your TH-215A/215E carefully and confirm that it is supplied with the following accessories.

- 1 Antenna.....T90-0352-05.....1 ea.
 - 2 Rubber cap.....B09-0307-04.....1 ea.
 - 3 Belt Hook (U.S.A. version)J29-0417-04.....1 ea.
 - 4 Self Tapping Screw (U.S.A. version).....N35-3005-412 ea.
 - 5 Spring washer (U.S.A. version).....N16-0030-412 ea.
 - 6 Ni-Cd Battery pack (PB-2)W09-0361-051 ea.
- or
- AA Manganese/Alkaline Battery caseA02-0728-031 ea.
- 7 Battery charger (120 V)W09-0315-051 ea.
(U.S.A. version) or
Battery charger (220 V)W09-0317-051 ea.
(European version) or
Battery charger (240 V)W09-0318-051 ea.
(U.K. version) or
Battery charger (240 V)W09-0319-051 ea.
(Oceania version)
 - 8 Instruction Manual.....B50-8120-00.....1 ea.
- or
- Instruction Manual.....B50-8121-00.....1 ea.
(U.K. version)
- 9 Warranty Card (U.S.A. only)1 ea.

BATTERY PACK

Installing the battery pack

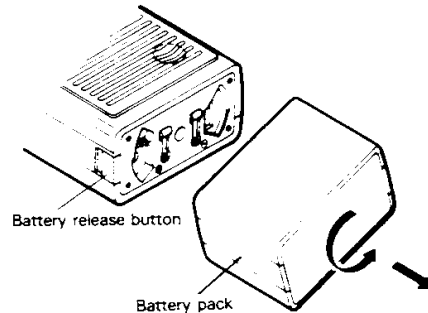
Match the concave part at the bottom of the radio to the convex part at the top of the battery pack.

Turn the battery pack clockwise until it clicks.

Be sure the pack and transmitter are locked together.

Removing

Pressing the battery release button, turn the battery pack counterclockwise.



Ni-Cd BATTERY PACK (PB-2)

NOTE:

This battery pack has not been charged at the factory in order to provide you with the greatest number of charge/discharge cycles. You must charge the battery before use. The battery pack will require several charge/discharge cycles before you can expect to see the maximum operating period between charges. If the battery will be stored for greater than 2 months it should be recharged before use.

RECHARGING THE BATTERY PACK

Insert the charge plug from the BC-2 into the receptacle on the rear of the battery pack. Then plug the BC-2 into the AC line. The LED on the BC-2 will illuminate to show that the pack is charging. The LED will remain on as long as the BC-2 is connected to the AC power source and the battery, indicating that the pack is still being charged. Therefore, do not forget to unplug the charger after approximately 15 hours. RECHARGING TIME: Approx. 15 Hours

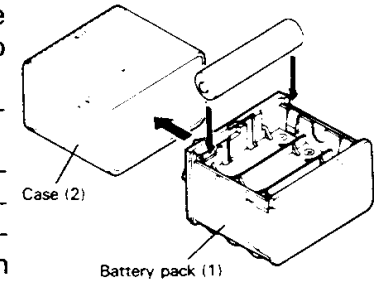
NOTES:

- Turn off the power switch before charging.
- Recharging should be done within ambient temperature between 10°C-40°C. Recharging performed out of this range may not fully charge the battery.
- Excessive charging, if happened, the battery performance and its life may lessen.

MANGANESE or ALKALINE BATTERIES

Load 6 SUM-3 manganese or alkaline batteries in series in the supplied battery case. (Be sure to observe the polarities.)

(We recommend use of high-performance manganese batteries.) Battery pack (1) can be inserted into case (2) only in a specific direction. Check the shape (top and bottom) after moving the stopper on the rear side, then insert the battery correctly. Inserting the battery by force without checking the shape may damage the case.



MEMORY BACK-UP BATTERY

The TH-215A/215E includes a lithium back-up battery to retain memory in the microprocessor. When changing batteries, or if the Ni-Cd batteries should fully discharge, memory will always be retained.

If the display should begin to show erroneous information or numbers, the lithium battery needs replacement.

This should be performed by an authorized KENWOOD dealer since these components are easily damaged by static electricity.

CONTROLS AND FUNCTIONS

① Antenna connector

This jack is used to connect the supplied antenna. Twist to lock with the BNC connector.

② DC IN terminal

This terminal is used for external power supply. Input voltages is from 7.2 to 16 V. The center is the (+) side and the sleeve is (-) side.

You should turn the power switch OFF when connecting this terminal. Pay attention to the polarity.

CAUTION:

For safety, do not remove the battery pack when a external power supply is used. Surely use KENWOOD optional cable (PG-2V or PG-3C).



③ MIC jack

This jack is used for an external microphone.

④ SP jack

This jack is used for an earphone or external speaker.

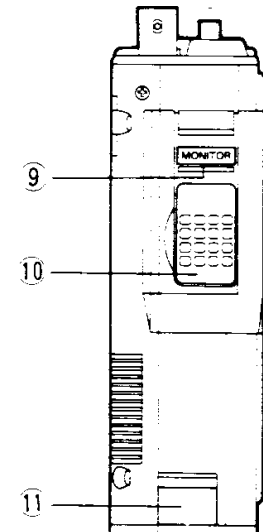
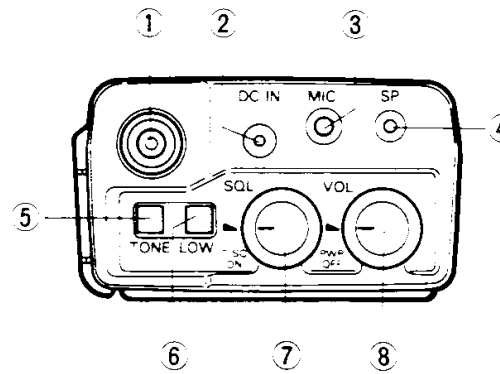
⑤ TONE switch

U.S. version: This switch is used to activate the sub-audible tone encoder.

European version: This switch is used to transmit a TONE signal. When the switch is pressed the repeater control signal of 1750 Hz is activated.

⑥ HI (■)/LOW (▬) switch

This switch is used to select the transmit output power.



⑦ SQL (Squelch) control

The SQL control is used to eliminate noise during no signal periods. Normally, this control is adjusted clockwise until the noise just disappears and the BUSY indicator goes OFF (Threshold level). For scan operation, this control must be set to the threshold point. When an incoming signal is weak or unstable, readjust the squelch for optimum reception.

⑧ Power switch and Volume control

Volume control with power ON/OFF switch.

⑨ MONITOR switch

During the MONITOR switch is pressed, squelch is release.

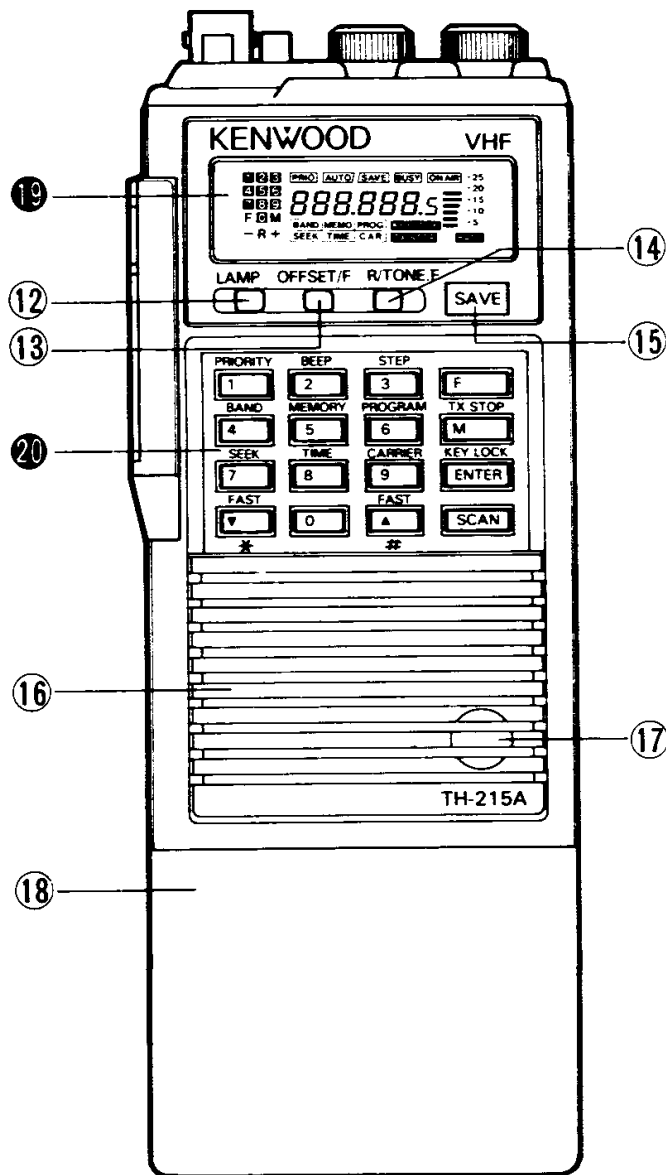
⑩ PTT (Push To Talk) switch

For transmission, press this switch and speak into the microphone.

⑪ RELEASE button

Used to release the battery case for removal.

Depress this button, and turn the battery case off.



⑫ LAMP key

This key controls the lamp on the LCD display.

NOTE:

When the LAMP is on battery drain will be accelerated. Do not use this feature unnecessarily.

⑬ OFFSET/F key

The OFFSET/F key is used to select the desired transmitter offset for repeater operation. Each time the key is pressed, the mode cycles from +600 kHz shift, to -600 kHz shift, to simplex, and back to +600 kHz shift. When the offset function is ON, the symbol “+” or “-” is displayed.

F: OFFSET FREQUENCY key

Pressing the **F** and the OFFSET/F key in order is used to change the desired offset frequency.

⑭ R/TONE. F (or REVERSE) key

This key is used to reverse the transmit/receive frequencies during repeater operation.

TONE. F: TONE FREQUENCY key (with the TH-215A)

Pressing the **F** and the R/TONE. F key in order is used to change the frequency of the tone encoder.

⑮ SAVE key

The SAVE key is used to select the power save condition during the receive mode.

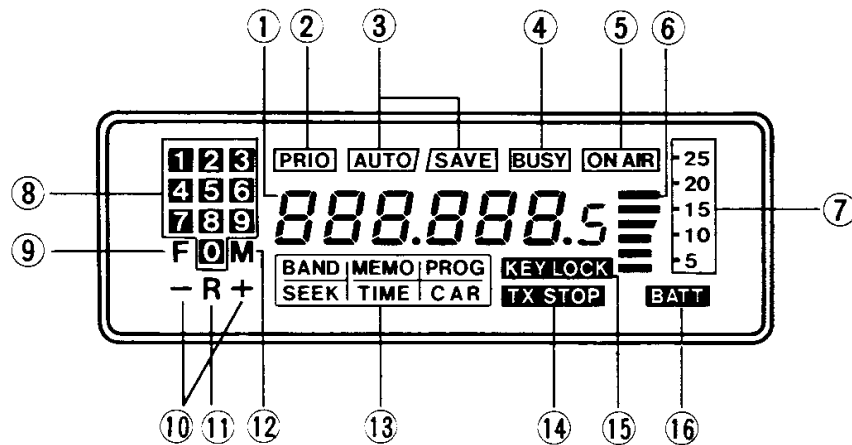
Pressing the **F** and the SAVE key in order is used to change the battery saver circuit rate.

⑯ SPEAKER

⑰ MICROPHONE

⑱ BATTERY CASE

19 Display



① FREQUENCY display

: Displays the operating frequency to the nearest kHz

② **PRIO**

: ON when the Priority Alert function is active.

Flashes when the channel is busy.

③ **AUTO/SAVE**

: Displays the selected power save condition;

AUTO/SAVE for auto save mode, **SAVE** for save mode, and no indicator for OFF.

④ **BUSY**

: ON whenever the squelch opens during receive.

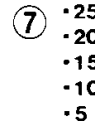
: ON all the time if the squelch control is rotated fully counterclockwise, and the T.SQ is off.

⑤ **ON AIR**

: ON during transmit mode.



: Used to indicate the relative receive signal strength, or as an indication of transmitter output power.



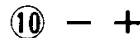
: Indicates the selected frequency step.



: Indicates the selected memory channel number.



: Indicates for approx. 5 seconds after pressing the **F** key.



: Displays the selected offset, minus or plus, and no indicator for simplex.



: On whenever the REVERSE function is active.



: Indicates for approx. 5 seconds after pressing the **M** key.



: Indicates the selected scan mode.

: Indicates the selected scan stop mode.

Flashes during scan.



: Indicates that the transmitter has been disabled by the TX.STOP key.



: Indicates that all keyboard functions except LAMP key has been disabled by the KEY LOCK is activated.



: ON when the battery voltage falls below the level for good communications. Recharge/replace the battery pack.

20 DOUBLE ROLE KEYS

PRIORITY 1	BEEP 2	STEP 3	F
BAND 4	MEMORY 5	PROGRAM 6	TX STOP M
SEEK 7	TIME 8	CARRIER 9	KEY LOCK ENTER
FAST ▼	0	FAST ▲	SCAN
*		#	

These 13 keys except the **F**, **SCAN**, and **0** keys, have double functions.

The 1st function is printed on the key.

The 2nd function is printed above the key.

All these 2nd functions are activate for approx. 5 seconds after pressing the **F** key.

- **Numeric keys:** 1 ~ 9, 0

These keys are used to select the desired operating frequency and/or memory channel number.

Memory channel 1, 8, and 9 also serve additional functions as discribed below.

M. channel 1 is used to store the Priority Alert channel information.

M. channel 8 is used to store the lower, and M. channel 9 the upper limit frequency for the programable band scan.

- **UP/DOWN keys:** ▲, ▼

These keys are used to increase or decrease the operating frequency, offset frequency, tone frequency, or the power saver circuit rate.

- **F: Function exchange key**

The **F** key is used to activate the 2nd function.

F indicator is displayed for approx. 5 seconds after pressing the **F** key.

CAUTION:

Press the 2nd function while F indicator is lit.

- **M: Memory key**

The **M** key is used to select a memory channel.

M indicator is displayed for approx. 5 seconds after pressing the **M** key.

CAUTION:

Select the memory channel within 5 seconds of pressing the **M** key.

- **ENTER key**

The **ENTER** key is used to enter a frequency selected by numeric keys.

- **SCAN key**

The **SCAN** key is used to start or stop the scan function.

● **PRIORITY CHANNEL CHECK key:** \boxed{F} + 1/PRIO

These keys are used to monitor whether the priority channel (CH 1) is busy or not. When this function is activated, the radio will switch to the CH 1 approximately once every 10 seconds.

To cancel this function, press these keys again.

● **BEEP key:** \boxed{F} + 2/BEEP

Each time these keys are pressed, the audio annunciator will be turned ON or OFF.

● **(FREQUENCY) STEP key:** \boxed{F} + 3/STEP

Each time these keys are pressed, the frequency scanning step size will be changed by 5 kHz.

Several different scan function keys are provided.

● **BAND SCAN key:** \boxed{F} + 4/BAND

● **MEMORY SCAN key:** \boxed{F} + 5/MEMORY

● **PROGRAMABLE BAND SCAN key:** \boxed{F} + 6/PROGRAM BAND SCAN: Scanning the entire band.

MEMORY SCAN: Scanning the memory channels repeatedly, skipping the vacant channels.

PROGRAMABLE BAND SCAN; Scanning between the limit specified in memory channel 8 and 9.

Several different scan stop keys are provided.

● **SEEK OPERATED SCAN key:** \boxed{F} + 7/SEEK

● **TIME OPERATED SCAN key:** \boxed{F} + 8/TIME

● **CARRIER OPERATED SCAN key:** \boxed{F} + 9/CARRIER

SEEK OPERATED SCAN: Stop on a busy channel.

TIME OPERATED SCAN: Resumes approx. 5 seconds after stopping, even if the signal is still present.

CARRIER OPERATED SCAN: Stop on a busy channel and then resume approx. 2 seconds after the signal disappears.

● **TX. STOP key:** \boxed{F} + M/TX. STOP

Pressing these keys ON will prevent accidental transmission.

To cancel this function, press these keys again.

● **KEY LOCK key:** \boxed{F} + ENTER/KEY LOCK

Place these keys ON and the selected frequency and other settings will remain unchanged by keyboard operation except the LAMP key.

To cancel this function, press these keys again.

● **FAST \blacktriangledown key:** \boxed{F} + \blacktriangledown /FAST

● **FAST \blacktriangle key:** \boxed{F} + \blacktriangle /FAST

OPERATION

■ FREQUENCY SELECTIONS

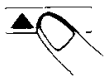
● To select by ▲, ▼ keys

Two different methods are provided for frequency selection.

- 1 Pressing either the ▲ or the ▼ key momentarily will cause the displayed frequency to change 1 step up or down, respectively.

The step size is selected by pressing the F and the 3/STEP key from 5 step sizes (5, 10, 15, 20, 25 kHz).

1 step up



1 step down



- 2 Pressing the ▲ or the ▼ key for more than 1 second will cause to change up or down continuously.

- 3 Pressing the F and holding the ▲ or the ▼ key will cause to change rapidly.

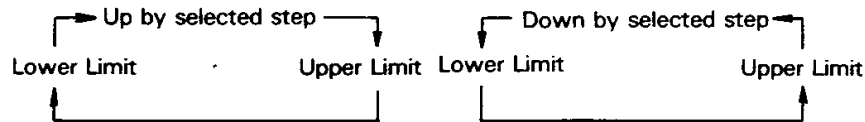
Rapidly up



Rapidly down



Repeating this operation shifts the displayed frequency as shown below.



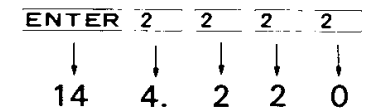
● To select by numeric keys

Press the ENTER key. The LCD display will show [14-.---].

Next input 4 numbers of each digit (1 MHz, 100 kHz, 10 kHz, 1 kHz). In digits of 1 MHz and 1 kHz, 10 numeric keys becomes as shown bellow.

Press digit	0,1,2,3,4	5	6,7,8,9
1 MHz	4	5	6
1 kHz	0	5	

For example

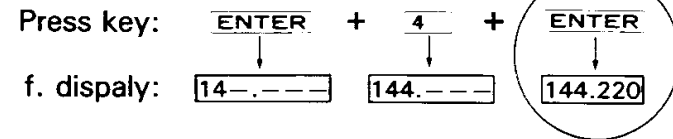


It is not necessary to enter all digits if you only want to change one or two. Several convenient editing features have been provided to ease this task.

Utilize ENTER KEY;

Frequency selection is finished and the digits not inputed remains unchanged.

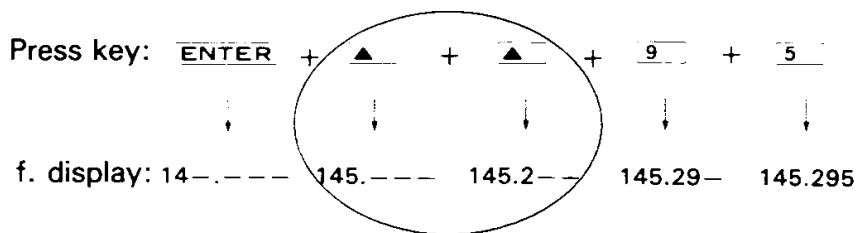
Example Current frequency: 145.220



Utilize ▲ KEY;

The digit remains unchanged and the next is waiting to rewrite.

Example Current frequency: 145.220

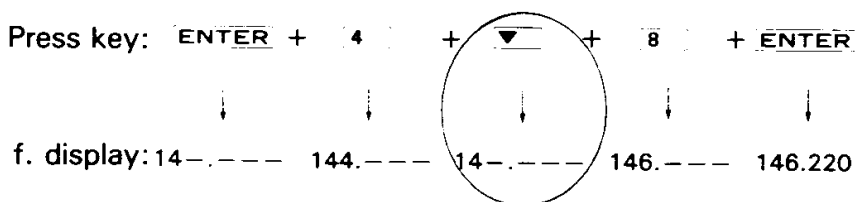


Utilize ▼ KEY;

Erase the last number.

Example

Current frequency: 145.220



NOTE:

The ▼ key will not function on the 1 kHz digit. If you depress the ▼ key after entry of the 1 kHz digit the radio will decrease in frequency 1 step.

RECEIVE

After power and antenna connections has been completed, set the switches as follows:

1. Turn the POWER/VOL control clockwise to turn on power. The frequency on the LCD display will show the transceiver is operating.
2. As the POWER/VOL control is turned clockwise, either background noise or a QSO will be heard.
3. To eliminate the no-signal noise turn the SQL control clockwise.
4. Enter the desired frequency.
5. Adjust the SQL control to the comfortable noise level.

TRANSMIT

Precaution: Check the intended transmit frequency before operating to prevent interference with other stations.

1. Simply depress the PTT switch and the ON AIR indicator will light.
2. Speak into the microphone. Recommended talk distance to the microphone is approximately 5 cm.
3. Release the PTT switch to return to receive and the ON AIR indicator will off.

CAUTION:

Long transmission or extended operation in the 5 watt mode might cause the rear of this transceiver to get warm. Do not place the transceiver where the heat sink (rear panel) might come in contact with plastic or vinyl surfaces.

■ REPEATER OPERATIONS

● Transmitter offsets

All amateur radio repeater utilize a separate receiver and transmitter section. The receiver frequency may be either above or below the transmitter frequency. For most repeaters this offset is ± 600 kHz. The TH-215A/215E allows you to store the frequency and offset in memory, or you can select the offset and offset frequency from the keyboard.

To select the desired offset, press the OFFSET/F key. Each time you press the key the radio will advance from one offset to the other, i.e. "+" to "-" to no offset or simplex.

To select the desired offset frequency, press the **F** and the OFFSET/F key. The display shows present transmitte offset. Ex [-1.500].

Press either the **▲** key or the **▼** key momentarily, the frequency change 100 kHz step up or down from lower limit 600 kHz to upper limit 9900 kHz. Press the **ENTER** key to complete the selection.

● Reverse function

Some repeater utilize a "reverse pair", i.e. the transmit/receive frequencies are exactlay the reverse of another repearter. For example repeater A uses 146.000 for a transmit frequency (OUTPUT) and 146.600 for receive (INPUT). Repeater B uses 146.000 for its receive and 146.600 for its transmit. It would be inconvenient to have to reprogram the radio each time if you were in range of both repeaters.

The R/TONE. F key has been provided to allow you to reverse the transmit and receive frequencies.

To use the REVERSE function, press the R/TONE. F (or REVERSE) key. The R indicator will light in the display.

To return to normal offsets press the R/TONE. F (or REVERSE) key again. This function is also useful to check the input frequency of the repeater so that you can determine if you are within SIMPLEX range.

● Tone operations

Some repeaters require the use of a control signal to activate the repeater. Several versions are currently in use worldwide.

In Europe a 1750 Hz tone is used in transmit. In the United Kingdom a 1750 Hz tone burst at the beginning of each transmission is used. Since use of these tones is required in the U.K. and in Europe the tone encoder is included as standard equipment.

The TH-215A provides the subaudible tone encoder, 38 standard tone frequencies in the United States are available.

The decoder section is an optional accessory (TSU-4). That allows for T.SQ (Tone Squelch) operation. With this option you will only hear those stations that transmit the same subaudible tone directly. To actiate the appropriate tone signalling device, depress the TONE switch on the top of the radio.

To select the tone frequency, press the **F** and the **R/TONE.F** key. The display shows operating tone frequency.

Ex. [---.123].

Press either the **▲** key or the **▼** key momentarily, the frequency change 1 step up or down. Press the **ENTER** key to complet the selection.

To actuate the tone squelch function (decode), turn the Squelch control fully counterclockwise past the detent. Squelch will now open only when the radio receives the same subtone frequency. To return to normal noise activated squelch, turn the Squelch control clockwise past the detent.

It is a good operating practice to check the frequency before transmitting. A **MONITOR** switch has been provided for this purpose when using the **TONE SQUELCH** function. Pressing this switch will open the squelch so you can check for activity.

NOTE:

A 97.4 Hz is available only to encode.

Tone Frequency

67.0 Hz	107.2 Hz	167.9 Hz
71.9 Hz	110.9 Hz	173.8 Hz
74.4 Hz	114.8 Hz	179.9 Hz
77.0 Hz	118.8 Hz	186.2 Hz
79.7 Hz	123.0 Hz	192.8 Hz
82.5 Hz	127.3 Hz	203.5 Hz
85.4 Hz	131.8 Hz	210.7 Hz
88.5 Hz	136.5 Hz	218.1 Hz
91.5 Hz	141.3 Hz	225.7 Hz
94.8 Hz	146.2 Hz	233.6 Hz
97.4 Hz	151.4 Hz	241.8 Hz
100.0 Hz	156.7 Hz	250.3 Hz
103.5 Hz	162.2 Hz	

● **Autopatch operations (with the TH-215A)**

Some repeaters offer a service known as **AUTOPATCH**. This allows you to dial a telephone number from your radio and carry out a telephone conversation, much like a car telephone, or cellular telephone. This function requires the use of a **DTMF** (Dual Tone Multi Frequency) pad. This is also known as a **touche tone pad**. It operates just like the **touche tone pad** on your home telephone. In addition to the normal 12 keys that are found on your telephone the **TH-215A** also provides 4 additional keys **A, B, C, and D**. These keys are required by some repeater systems for various control functions. You should check with the control operator of your repeater to determine if their use is required. A chart is provided that lists the tones that are generated when you press each key.

To use the **touche tone pad** you should first key the radio using the **PTT** switch. Then simply press the numbers corresponding to the telephone number you want to dial. Some repeaters will require a special sequence of keys to activate the autopatch. Again you should check with the control operator of your repeater for this sequence.

After you have pressed

the first number key the radio will remain keyed for approximately 2 seconds. This is done so you do not have to hold the **PTT** switch depressed while dialing. The radio remains keyed after you press each number for this 2 second interval.

	Audio tones (Hz)			
Column Row	1215.9	1331.7	1471.9	1645.0
701.3	1	2	3	F=A
771.4	4	5	6	M=B
857.2	7	8	9	ENTER=C
935.1	*	0	#	SCAN=D

■ SCAN

Scan is initiated by pressing the SCAN key.

The TH-215A/215E will stop on a busy channel. When an incoming signal is detected during scanning, the BUSY indicator will light. In order for this function to operate the SQL control must be adjusted to the threshold point. Scan direction can be selected by either the ▲ or the ▼ key before initiating scan.

The selected scan mode and scan stop mode indicators will flash ON and OFF during scanning.

● SCAN MODES

1. **BAND SCAN MODE:** Scanning the entire band.
2. **MEMORY SCAN MODE:** Scanning the memory channels repeatedly, skipping the vacant channels.
3. **PROGRAMMABLE BAND SCAN MODE:** Scanning from the frequency stored in memory channel 8 to 9.

If the frequency stored in memory channel 8 is the same or greater than in memory 9, or either or both channels are vacant, the scan will proceed over the entire band.

If $M.CH8 \geq M.CH9$

- Programmable band scan
- Band scan

If SCAN is initiated while the displayed frequency is outside the range specified in memory channels 8 or 9, scan will proceed outside of the programmed limits.

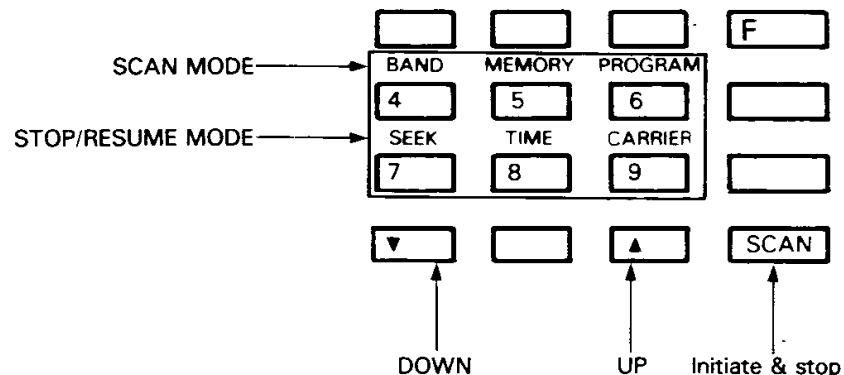
In the BAND SCAN and PROGRAMMABLE BAND SCAN MODE, scan proceeds according to the selected step size.

● SCAN STOP AND RESUME MODES

1. **SEEK OPERATED SCAN:** Scan will stop on a busy channel and will be released when a signal is present and squelch is open.
2. **TIME OPERATED SCAN:** Scan will resume approx. 5 seconds after it stay even if a carrier is still present, or has already dropped out.
3. **CARRIER OPERATED SCAN:** Scan will hold as long as the signal is present and resume scan after a 2 second delay if the signal disappears.

Scan release: Press one of the following keys during scanning to clear the scan mode.

- a) SCAN key
 - b) PTT switch and other keys
- (These keys does not continues it's own function.)



■ MEMORY

● MEMORY CHANNELS

The 10 memory channels (1 through 9, and 0) are available for data entry. Channel 1, 8 and 9 have the following functions in addition to its ordinary function.

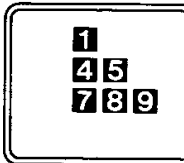
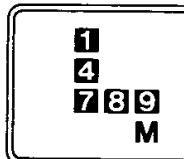
Channel 1 is the Priority Alert Channel.

Channel 8 is the lower, and channel 9 is the upper limit frequency for the programmable band scan operation.

The memory channels can store RX Frequency, F. STEP status, OFFSET, REVERSE switch status (TH-215A), and TONE Frequency.

● MEMORY ENTRY

1. To store data into memory, press the **M** key. The display will indicate M and any memory channels that contain data. (Ex. 1, 4, 7, 8, 9)
2. Press the desired memory channel number (Ex. 5) within 5 seconds of pressing the **M** key. This will actually store the information into memory.



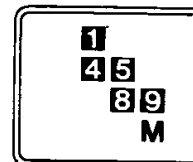
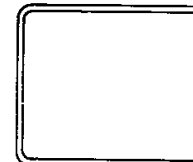
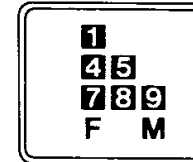
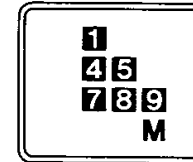
● MEMORY RECALL

To recall data from memory, only press the desired memory channel key. Then the data already stored into the memory channel will now appear in the display, and the radio will switch to this frequency.

To return to the original operating frequency, press the same memory channel key again.

● CLEANING A MEMORY CHANNEL

1. Press the **M** key. The display will indicate the M and any memory channels that contain data. (Ex. 1, 4, 5, 7, 8, 9)
2. Press the **F** key. The display is added the F.
3. Within 5 seconds press the desired channel numbers to clear. (Ex. 7) Then the M, the F, and all the channel numbers disappear. Cleaning has been completed.
4. To check the cleaning, press the **M** key. (Ex. the 7 will now be gone.)



● CLEANING ALL MEMORY CHANNEL (= Microprocessor Initialization)

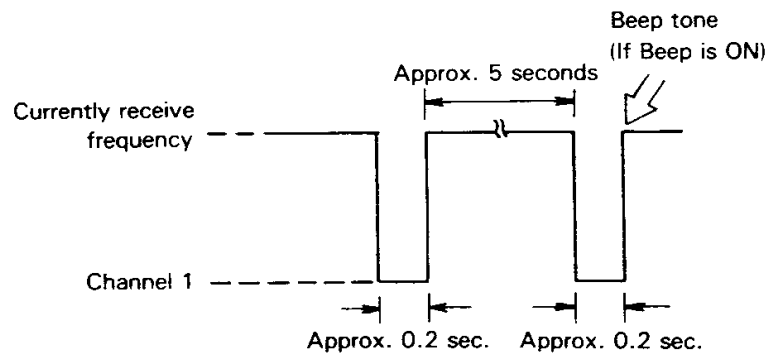
To erase all data from the memory, turn the power switch on while pressing both the **F** and the **ENTER** keys.

■ PRIORITY ALERT CHANNEL CHECK

Memory channel 1 can be monitored at about 5 seconds intervals to check for activity.

Press the **F** key and 1/PRIO key, **PRIO** will appear on the display.

If the channel is busy, the **PRIO** blinks.



Memory channel 1

Not used..... **PRIO** displaying
 Busy..... **PRIO** blinking

To stop the function, press these keys again.

The function does not operated during scan and transmission.

■ BATTERY SAVER

Battery Saver operation provides to turn ON or OFF battery power automatically during reception and thus extend operation time.

2 ACTIVATION MODES

- SAVE MODE:** Activate the circuit 2 seconds after the squelch closes.
- AUTO SAVE MODE:** Activate the circuit 1 munit after the last key operation during the squelch closes.

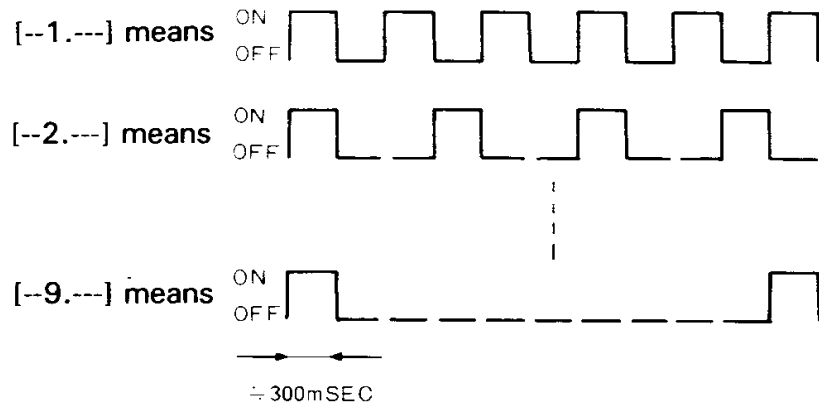
To select the desired Battery Saver Mode, press the **SAVE** key. Each time press the key, radio will advance from SAVE to AUTO SAVE to OFF.

SAVE MODE : **SAVE**
 AUTO SAVE MODE : **AUTO/SAVE**
 OFF : No indicator

To alter the actual length of time the receiver section shuts down, press the **F** key and then the **SAVE** key. The display will show the time the radio will be operating at reduced power levels.

The radio will operate at reduce power consumption according to the accompanying diagram.

For example:



When a signal is received, the function is automatically released.

As the receiver section shuts down, the squelch is not closed by pressing the MONITOR switch. (It is Approx. 2 seconds in the ratio 1 : 9.)

■ BEEP TONES

Audible confirmation of microprocessor function is provided in the form of a series of audio beeps.

To activate beep tones, press the **F** key and 2/BEEP key.

The radio will then supply audio confirmation according to the chart below.

	Frequency (Hz)	Key or key operations
A	440.00 Hz	MR 0
A #	466.16 Hz	MR 1
B	493.88 Hz	MR 2
C	523.25 Hz	MR 3, SAVE ON
C #	554.37 Hz	MR 4, OFFSET
D	587.33 Hz	MR 5, To select OFFSET Frequency.
D #	622.26 Hz	MR 6, REV, To select Tone Frequency
E	659.25 Hz	MR 7, TXSTOP, SAVE AUTO
F	698.46 Hz	MR 8, To change the rate of Power Save time, ENTER
F #	739.98 Hz	MR 9, KEYLOCK
G	783.98 Hz	DOWN, SAVE OFF
G #	830.61 Hz	UP
A	880.00 Hz	F
A #	932.33 Hz	M
B	987.77 Hz	Stopping scanning
F	1396.91 Hz	Key operation without effect.

MAINTENANCE

■ IN CASE OF DIFFICULTY

Indicator does not light and frequency is not displayed when power switch is pressed.

Wrong power polarities. Be sure to observe the polarities.

Display is dark. (**BATT** lights.)

Input voltage is low. Check voltage.

No sound from the speaker. No signal can be received.

1. Squelch is closed. Turn the SQL knob counterclockwise.
2. T.SQ is activated. Turn the SQL knob clockwise past the detent position.
3. PTT switch of microphone is pressed setting the unit in the transmit mode. Turn PTT switch off.

No control works.

KEY LOCK is ON. Press **F** key and KEY LOCK key.

No output

1. Microphone jack is not fully plugged in. Insert the plug fully.
2. Poor antenna connection. Connect antenna securely.

Memory loss.

Backup battery voltage is low. Contact the authorized dealer.

All the indicators go out of the display.

Turn the power switch OFF and then ON.

■ SERVICE

Should it ever become necessary to return the equipment to your dealer or service center for repair, pack in its original box and packing, and include a full description of the problems involved. Also include your telephone number. You need not return accessory items unless directly related to the service problem.

Service note: Dear OM, if you desire to correspond on a technical or operational problem, please make your note short, complete, and to the point. And PLEASE make it readable.

Please list: Model and serial number.

The question or problem you are having.

When claiming warranty service, a photocopy of the bill of sale, or other proof of purchase showing the date of sale must accompany the radio.

OPTION

SWIVEL HOOK
BH-5

TELESCOPIC ANTENNA
RA-3

SOFT CARRYING CASE
SC-13
(for PB-1/4)

SOFT CARRYING CASE
SC-12

ULTRA-LIGHT HEADPHONES
HS-7
MICRO HEADPHONE

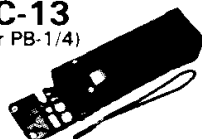
HS-8
MOBILE BRACKET
MB-4 ✓

DC LINE NOISE FILTER
PG-3C
(for MOBIL CIGAR OUTLET)

DC CABLE
PG-2V ✓

EXTERNAL SPEAKER/MICROPHONE
SMC-30 ✓

TONE SQUELCH UNIT
TSU-4



POWER SUPPLY

Ni-Cd RECHARGEABLE BATTERY PACK

PB-1
12V 800mAh
5245



Ni-Cd RECHARGEABLE BATTERY PACK

PB-3
7.2V 800mAh
1295



AA BATTERY CASE



Ni-Cd RECHARGEABLE BATTERY PACK

PB-2
8.4V 500mAh



Ni-Cd RECHARGEABLE BATTERY PACK

✓ **PB-4**
7.2V 1600mAh
8595



BATTERY CHARGER

BC-2
(for PB-2 only)

RAPID CHARGER

BC-7
(for PB-1/2/3/4)



COMPACT CHARGER

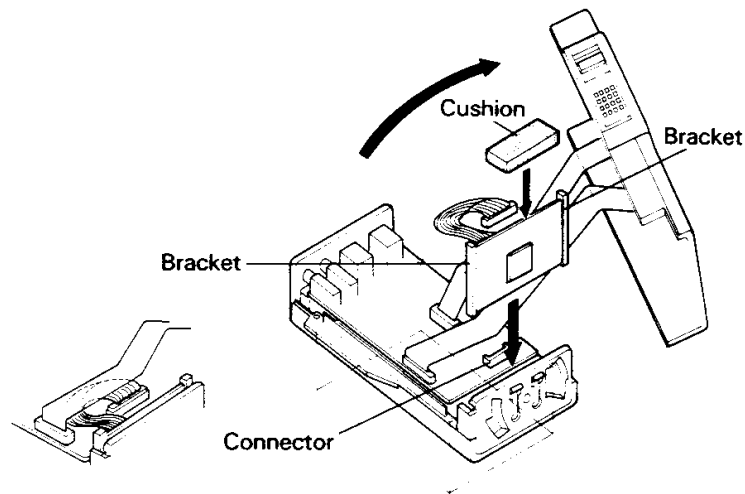
BC-8
(for PB-1/2/3/4)



NOTE: Some optional accessories may not be available in your areas.

■ TONE SQUELCH UNIT (TSU-4)

● INSTALLATION

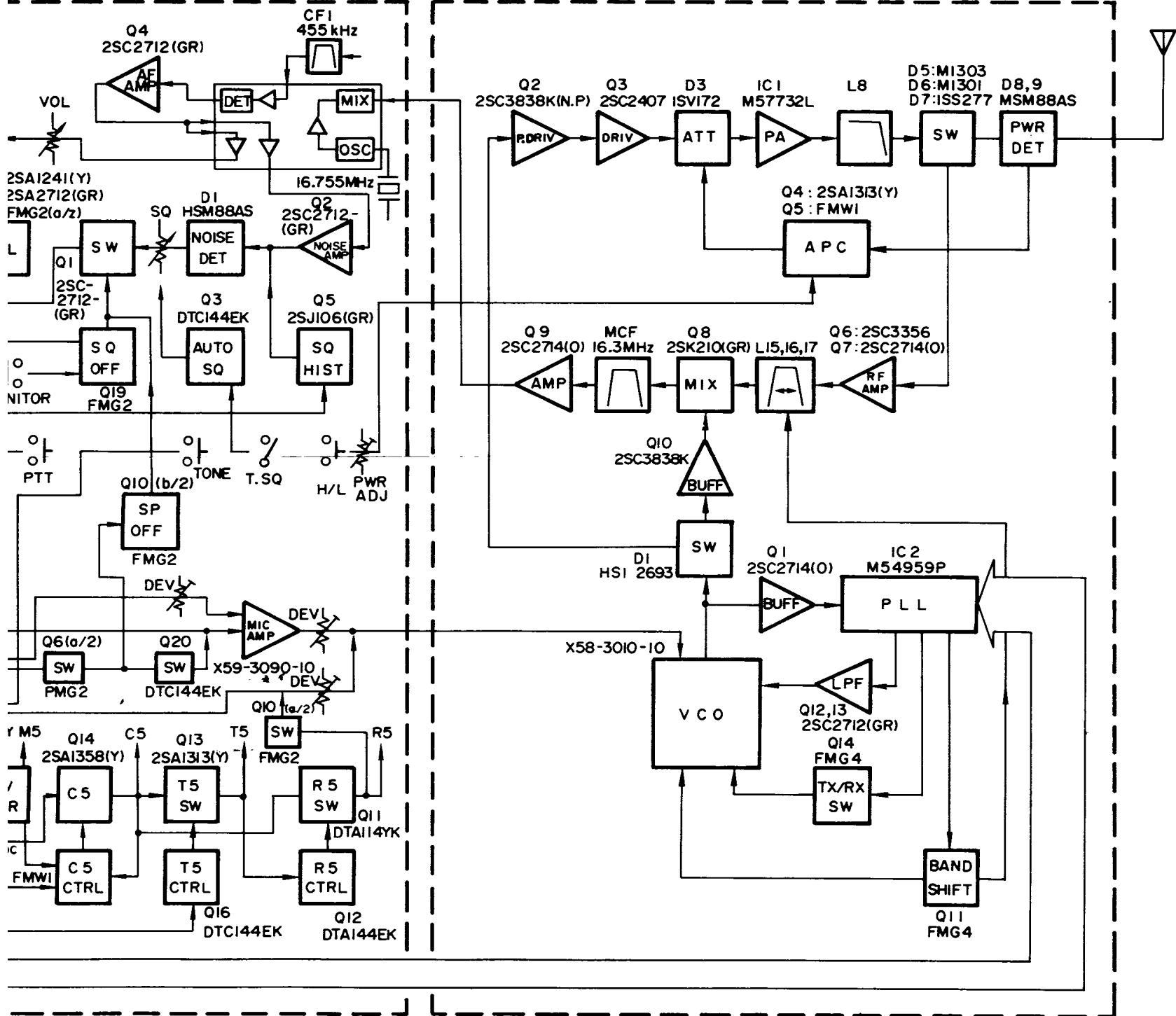


1. Remove the four phillips head screws from the rear corners of the radio.
2. Turn the case over and gently remove the front panel. The panel should be rotated away from the PTT switch side.
3. Remove the foam cushion attaching the bottom of the set. Install the tone squelch unit between the bottom of the set and the main circuit board.
4. Attach the cable from the TSU-4 as shown in the diagram. The cable should be routed under the ribbon cable that goes to the front panel.
5. Remove the backing from the foam cushion that was provided with the TSU-4 and attach the cushion to the back of the TSU-4.
6. Replace the covers and tighten the screws to complete the installation.

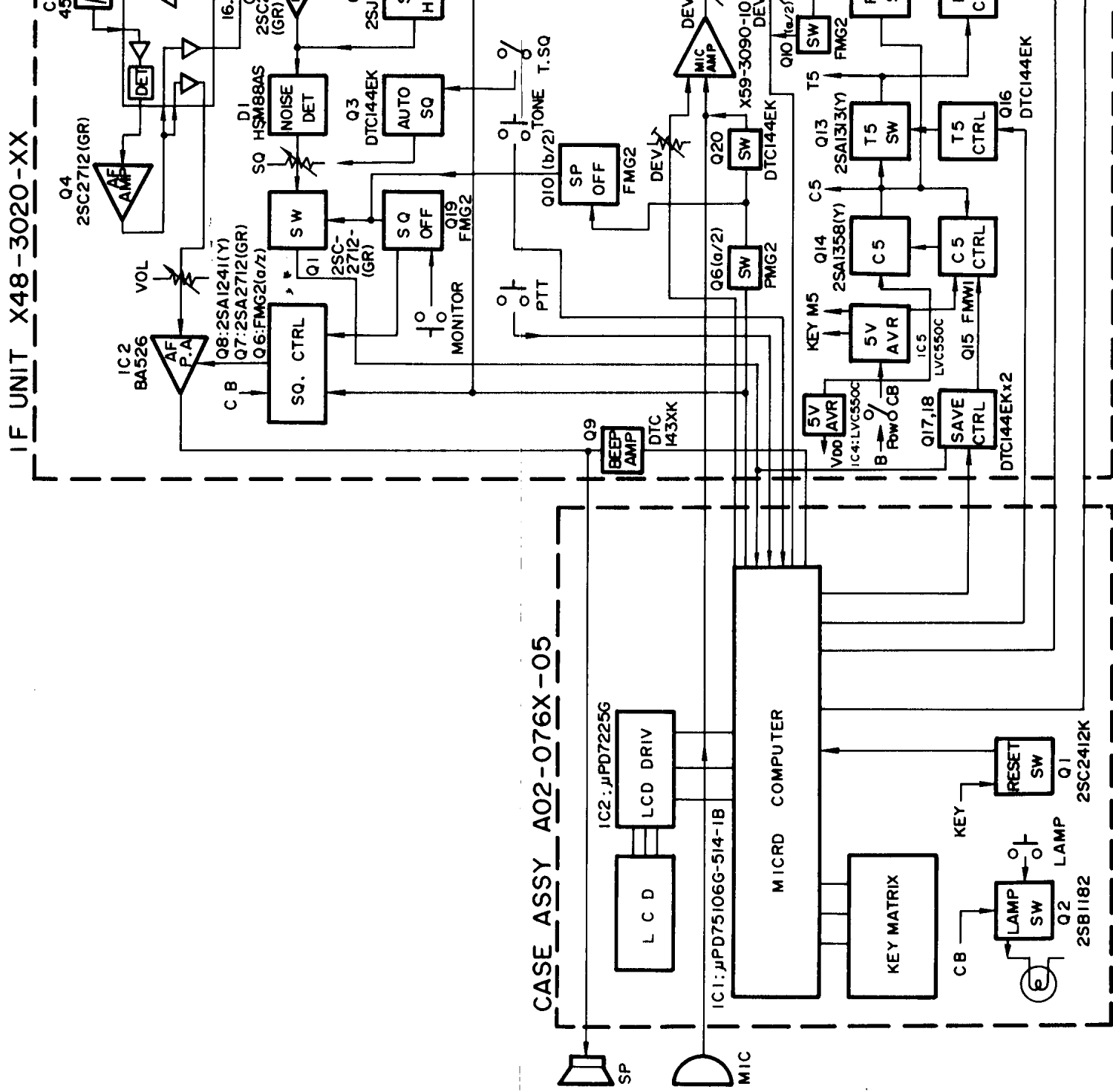
KENWOOD.

X48-3020-XX

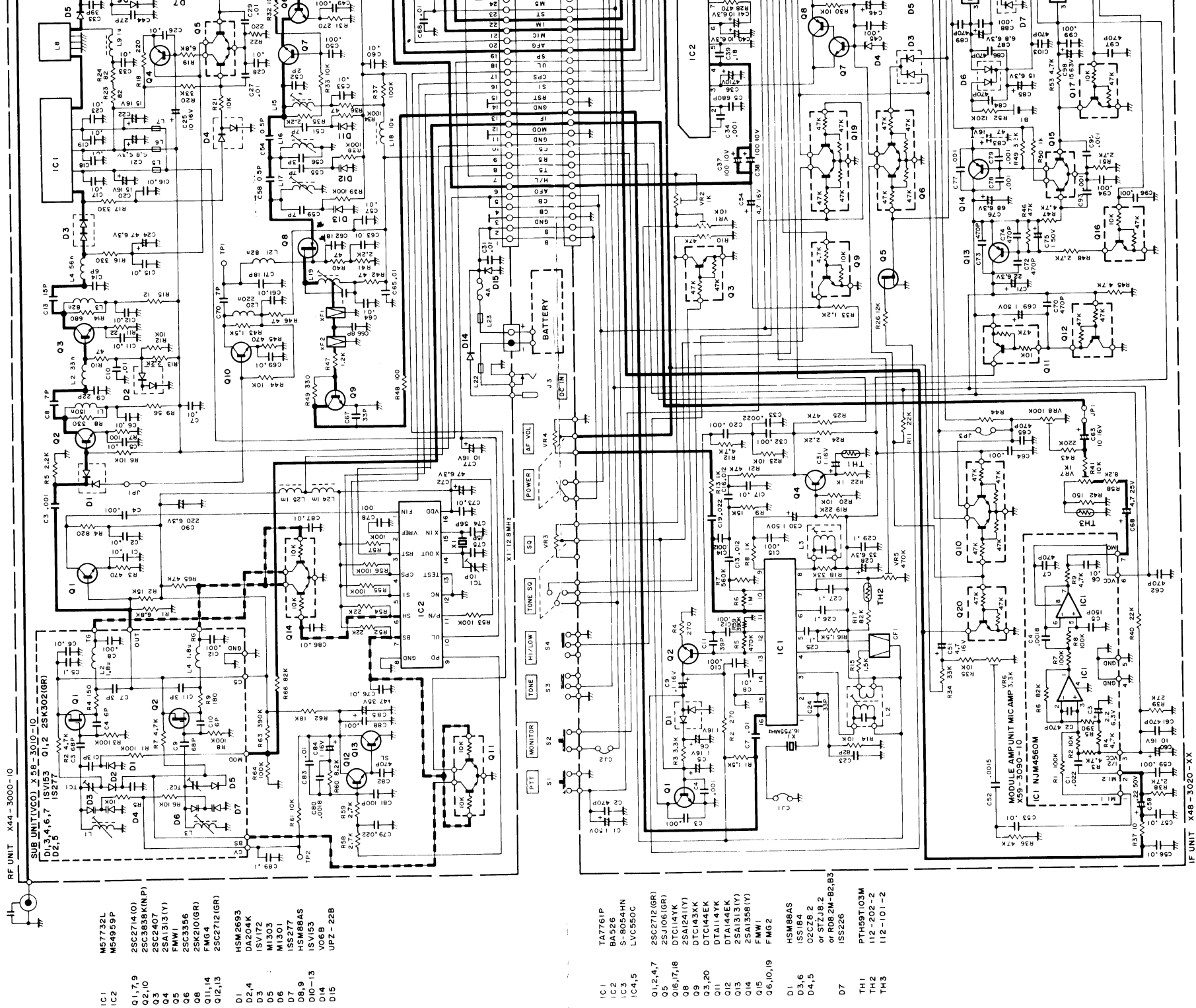
RF UNIT X44-3000-10



TH-215A/215E BLOCK DIAGRAM



TH-215A/215E SCHEMATIC DIAGRAM



- IC1 M57732L
- IC2 M54959P
- Q1,7,9 25C2714(O)
- Q2,10 25C3838(K(N,P))
- Q3 25C2407
- Q4 25A1313(Y)
- Q5 FMW1
- Q6 25C3356
- Q8 25K210(GR)
- Q11,14 FMG4
- Q12,13 25C2712(GR)
- D1 HSM2693
- D2,4 DA204K
- D3 ISV172
- D5 MI303
- D6 MI301
- D7 ISS2277
- D8,9 HSM88AS
- D10-13 ISV153
- D14 VO6B
- D15 UPZ-22B

- IC1 TA7761P
- IC2 BA526
- IC3 S-8054HN
- IC4,5 LVC550C
- Q1,2,4,7 25C2712(GR)
- Q5 2SJI06(GR)
- Q6,17,18 DTC114YK
- Q8 2SA1241(Y)
- Q9 DTC143XK
- Q3,20 DTC144EK
- Q11 DTA114YK
- Q12 DTA144EK
- Q13 2SA1313(Y)
- Q14 2SA1358(Y)
- Q15 FMW1
- Q6,10,19 FMG2
- D1 HSM88AS
- D3,6 ISS184
- D4,5 02CZ8 2 or STJ8.2 or R08.2M-B2,B3
- D7 ISS226
- TH1 PTH59T103M
- TH2 112-202-2
- TH3 112-101-2

JP3	R44	R43	C65	VR8	P10	Q20
215A	470K	—	—	—	—	—
215E	—	C13	—	—	—	—

