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800MHz FM TRANSCEIVER

TK-480

SERVICE MANUAL

M2 Version

KENWOOD

B51-8665-00 (N) PDF

This service manual has new information that is not covered by the TK-480/481 (REVISED II) service manual (B51-8408-20).
Refer to the TK-480/481 (REVISED II) service manual (B51-8408-20) for items not provided in this service manual.

CONTENTS

CAUTION
When using an external power connector, please use with maximum final module protection of 9V.

GENERAL / SYSTEM SET-UP

INTRODUCTION

SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of this publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions, which are issued as required.

ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts : components, kits, and chassis. If the part number is not known, include the chassis or kit number of which it is a part and a sufficient description of the required component, for proper identification.

PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

- DO NOT transmit until all RF connectors are secure and any open connectors are properly terminated.
- SHUT OFF this equipment when near electrical blasting caps or while in an explosive atmosphere.
- This equipment should be serviced by only qualified technicians.

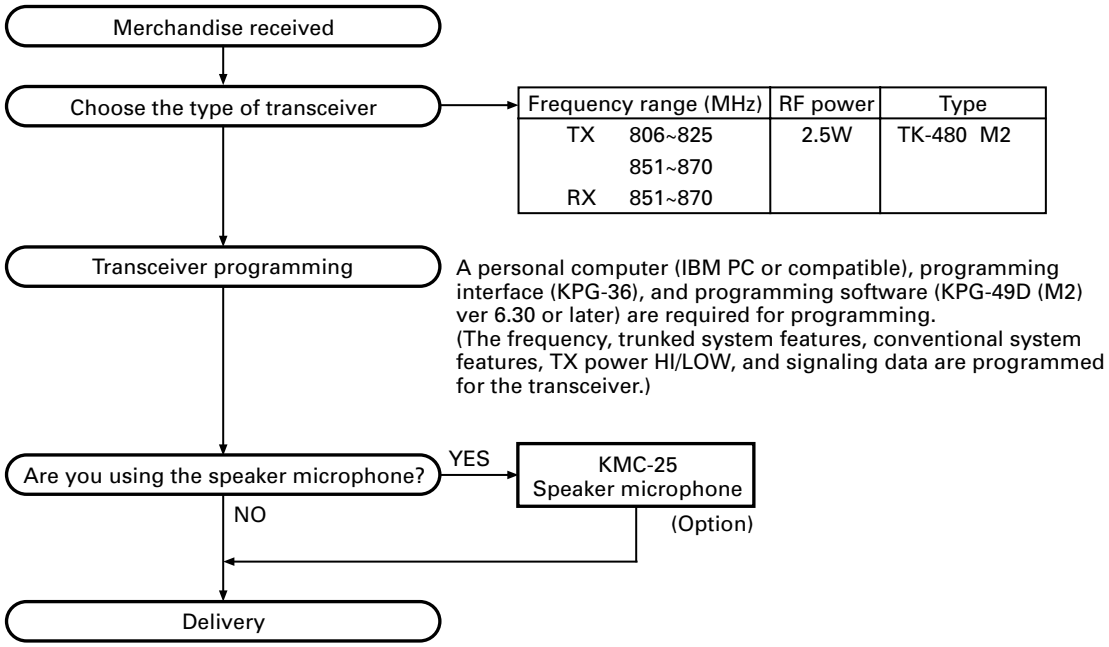
SERVICE

This radio is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

Model & destination		Unit		Frequency range	Remarks	Charger	Battery	12 key
		TX-RX unit	DISPLAY unit					
TK-480	M2	X57-5630-10	X54-3210-11	806~870MHz	IF1 : 44.85MHz LOC : 44.395MHz	Option	✓	✓

Note : X57-5630-10/X54-3210-11 : Produced in Singapore

SYSTEM SET-UP



OPERATING FEATURES

1. Operation Features

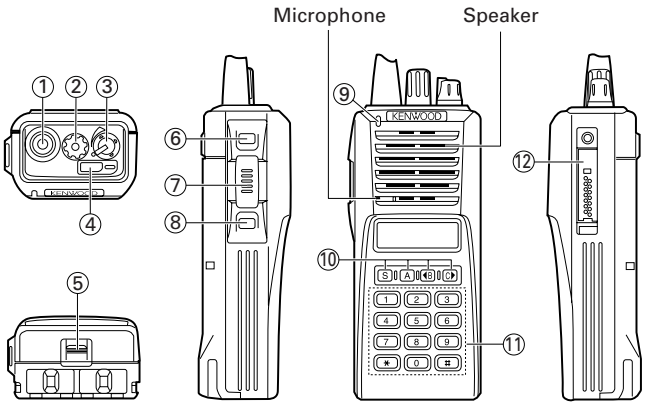
The TK-480 is an 800MHz band EFJ LTR™-compatible trunked radio designed to operate in both trunked and conventional modes. The programmable features are summarized.

Model — Trunking mode
Model — Conventional mode

This model can handle up to 32 systems with up to 250 groups in each system. The transceiver can be used in both trunked mode and conventional mode. Systems, groups, and their functions are programmed.

2. Transceiver Controls and Indicators

2-1. Physical Layout



2-2. Panel controls

The key on the top and front panel is momentary-type push buttons. The functions of these keys and knob are explained below.

① Antenna connector
Connect the supplied antenna here.

② System or Group selector knob (Programmable)
Turning the system (or group) selector knob clockwise increases the system (or group) number by one. Turning the knob in the counterclockwise direction decreases the system (or group) number by one.
After the system number (or group number) reaches the highest system number (or group number), it goes back to lowest system number (or group number).
System numbers (or group numbers) not set are skipped.
Caution : The FPU (KPG-49D (M2) ver 6.30 or later) allows selecting between system selector and group selector.

③ Volume/Power switch
Transceiver Power and Volume switch. Turn clockwise to switch On the transceiver. Turn counterclockwise fully to switch OFF the transceiver. Also adjusts the volume level. When the power is switched off, all the parameters, such as the system and group, are stored in memory. When the power is switched on again, the system returns to the previous conditions.

④ Auxiliary (orange) key (Programmable)

⑤ Battery pack release catch
Push down to release the battery pack. See Installing the Ni-Cd Battery Pack.

⑥ MONITOR key* (Programmable)

⑦ PTT (Push-To-Talk) key
Press this key, then speak into the microphone to call a station.

⑧ LAMP key* (Programmable)

⑨ TX/BATT indicator
This red LED lights during transmission (it does not light during busy or when transmit is prohibited). If the battery voltage falls below the programmed voltage during transmission, the brightness of this indicator decreases at intervals of about one second, so it can be used as the battery voltage alert function.

⑩ S, A, ◖B, and C◗ key (Programmable)

⑪ DTMF keypad
Press the keys on the telephone keypad to send DTMF tones.

⑫ Universal connector
Connect the external KMC-25 speaker/ microphone (optional) here. Otherwise, keep the supplied cover in place.

* : MONITOR and LAMP are arbitrary names chosen for these buttons. They can be used for any of the auxiliary functions.

2-3. Programmable keys

The FPU (KPG-49D (M2) ver 6.30 or later) enables programmable keys to select the following functions.

Auto Tel, AUX(only when Voice Scrambler is not selected), DTMF ID (BOT), DTMF ID (EOT), Display Character, Emergency (only AUX key), Function, Group Down, Group Up, Home Group, Key Lock, Lamp, Memory (RCL/STO), Memory (RCL), Memory (STO), Monitor A, Monitor B, Monitor C, Monitor D, Redial, RF Power Lo, Scan, Scan Del/Add, Scan Temporary Delete, Scrambler (Only when Voice Scrambler is selected), SP Attenuation (Only MIC switch), System Down, System Up, TEL Disconnect and none.

These functions the FPU programs to the function keys are described in the following sections.

OPERATING FEATURES

■ Auto TEL

Automatically connects available repeaters that are connected to telephone circuits when operating as LTR system. The time allocated to search for available repeaters is 60 seconds, after which connection failure occurs, a DTMF tone is output and the function terminates.

If connection to an available circuit is made, only ID 253, EOT or hang-up time-out can terminate the function.

■ AUX

This function can be programmed when the voice scrambler board is not installed.

If this key is pressed, an underscore ("_") appears at the extreme right of the LCD and AUX port which is inside of the transceiver turns to the active level. If pressed again, the underscore disappears and the AUX ports turns to the deactive level.

■ DTMF ID (BOT)

Pressing this key in Conventional mode, automatically sends the preset Connect ID.

■ DTMF ID (EOT)

Pressing this key in Conventional mode, automatically sends the preset Disconnect ID.

■ Display character

This key switches the LCD display between the system/group number and system/group name.

■ Emergency

Pressing this key for longer than the programmed "Emergency Key Delay Time" causes the transceiver to enter the emergency mode. The transceiver jumps to the programmed "Emergency System/Group" and transmits for the programmed "Active Time".

The transceiver disables mic mute while transmitting. After finishing transmission, the transceiver receivers for the programmed "Interval Time". The transceiver mutes the speaker while receiving. Following the above sequence, the transceiver continues to transmit and receive.

If "Man Down Switch" has been programmed on the radio and the switch is activated, the radio enters Emergency mode after the specified "Man Down Delay Time" expires.

■ Function

Pressing this key causes the transceiver to display "FCN". Then, pressing a DTMF key causes the corresponding programmed function to start. This key may be convenient when using many functions with the 12-key keypad.

■ Group up/down

When the key is pressed each time, the group number to be selected is incremented/decremented and repeats if held for one second or longer.

■ Home group

Each pressing of the key selects a preset system/group.

■ Key lock

Pressing this key causes the transceiver to accept entry of only the [Function], [Key Lock], [PTT], [Lamp], [Monitor A], [Monitor B], [Monitor C], [Monitor D], and [Emergency] keys.

The locked keys also include the tuning control.

■ Lamp

This key illuminates the LCD and keys on the front panel. When the key is pressed, the LED lamp goes on.

When it is released, the lamp goes off after about five seconds. If any key is pressed while the LED lamp is on, the lamp is kept on for five seconds.

■ Memory

This key allows DTMF memory data to be recalled; up to 32 memories each with a memory dial of up to 16 digits and an A/N of up to 10 digits per memory.

■ Monitor

Used to release signalling or squelch when operating as a conventional. It is also used to reset option signalling.

■ Redial

Pressing this key when System/Group is shown, displays the previously transmitted DTMF code. Pressing [PTT] at this time, transmits the code that is currently displayed.

■ RF power low

Used to temporarily switch transmission output to low power. Turning the function on enables:

Hi→Low, Low→Low

Key states are backed up, except in the PC mode when they are reset.

■ Scan

Press this key starts scanning. Pressing this key stops scanning.

■ Scan Del/Add

Used to select whether system scan routines are used during system scan. Each pressing of the key (to ON) toggles between lockout and lock. The scan routine is started when on lock. The DEL indicator flashes when the system is on lockout.

■ Scan temporary delete

This key is temporarily deleted a system being scanned. If you press this key when scan is stopped (when a call is being received from another station), the system is temporarily deleted and scanning restarts.

This key operates even when "Scan Type" is set to "List Type System Scan".

■ Scrambler

If a scrambler code (1 to 4) has been set in the FPU, an underscore ("_") appears at the extreme right of the LCD display when scrambler is active. Pressing this key changes ON/OFF of scramble operation.

Holding this key down for 2 seconds sets Scramble Code Select Mode.

OPERATING FEATURES

■ System up/down

When the key is pressed each time, the system number to be selected is incremented/decremented and repeats if held for one second or longer.

■ Telephone disconnect

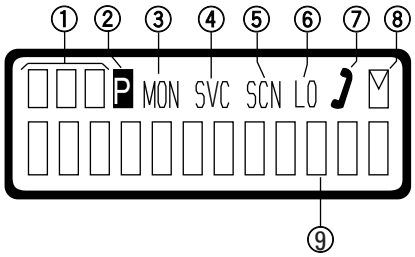
Pressing this key ends an RIC connection (disconnects the telephone line).

■ None

Sounds error operation beep, and no action will occur.

Use this function when the transceiver is required to be more simple operated.

2-4. Display



① Sub display

Displays the system and group numbers. Also displays various functions which have been programmed.

② P (Priority) indicator

The P indicator (P) appears when a selected channel is programmed as priority, in conventional operation.

③ MON (Monitor) indicator

The MON indicator appears when the button programmed as MONITOR is pressed.

④ SVC (Service) indicator

This icon is not used on this transceiver.

⑤ SCN (Scan) indicator

The SCN indicator appears when using Scan mode.

⑥ LO indicator

Appears when low power is selected.

⑦ Handset indicator

The handset indicator ( ) appears when the selected group is programmed as telephone IDs.

⑧ MAIL indicator

Flashes when a status message (DMS) is received. Lights when a status message is stored in the stack memory.

⑨ Alphanumeric display

The twelve-character dot matrix alphanumeric display shows the system and group numbers. You can program system and group names with up to ten characters in place of these numbers. The left display is used as a delete indicator (▶) and the right is used for the selective call (⁜) or scrambler (_) function. The delete/add indicator shows the systems locked out of the scanning sequence. Selective call and scrambler are optional functions that can be programmed. Also displays received messages when using DMS (Digital Message System).

3. Option Signalling

3-1. DTMF

Built-in DTMF decoder is available for option signalling.

It is possible to use individual call, group call, D.B.D. (Dead Beat Disable). D.B.D. is used with DTMF only.

If the option signalling matches, a predetermined action will occur.

If option signalling matches on a group which is set up with option signalling, the option signalling indicator (⁜) will flash and option signalling will be released. The transpond or alert tone will sound.

If the selective call alert LED is set up, the orange LED will flash.

While option signalling matches (or if option signalling is deactivated when you are transmitting), you can mute or unmute ID/QT/DQT/Carrier.

■ AND/OR

You can select AND or OR for option signalling match conditions.

	Alert/Transpond
AND	QT/DQT/ID+DTMF; Option matches = Action
OR	QT/DQT/ID+DTMF; Option matches = Action
	AF mute open
AND	QT/DQT/ID+DTMF; Option matches = Action
OR	QT/DQT/ID; Signalling only matches = Action

With OR set up, alert/transpond will not function with only DTMF.

With OR set up, AF mute will not release when only DTMF matches.

With a conventional group not set up with QT or DQT, only the carrier is considered when signalling matches.

■ Auto Reset

If option signalling matches a group set up with option signalling, option signalling is released. After matching option signalling, option signalling will temporarily reset automatically.

OPERATING FEATURES

■ Dead Beat Disable

If the D.B.D. code matches, a predetermined action will occur. Whether option signalling is activated or not, when D.B.D. matches on any group, the transceiver will become TX inhibited or TX/RX inhibited. While D.B.D. is active, if the D.B.D. code + "#" code is received, D.B.D. will disactivate.

When D.B.D. matches, transpond will function. Alert will not be output, and option signalling match icon will not appear.

3-2. MSK

Built-in MSK (DMS : Fleet-ID) decoder is available for option signalling. When the group ID matches, squelch remains muted while the station waits for reception of proper MSK signal. When MSK signal matches, squelch unmutes.

■ AND/OR

AND : QT/DQT/ID + MSK to unmute. MSK matches = alert tone

OR : QT/DQT/ID to unmute. MSK matches = alert tone

4. Alphanumeric Two-way Paging Function (Digital Message System)

4-1. General

The Alphanumeric Two-way Paging Function (DMS) is a Kenwood proprietary protocol. It enables a variety of paging functions.

4-2. ID Construction

A radio unit ID is defined by a combination of 3-digit Fleet and 4-digit ID numbers. Each radio unit must be assigned its own Fleet and ID numbers.

4-3. PTT ID

A pre-programmed unique ID can be sent at the beginning of transmission and/or the end of transmission to identify which radio unit is on air.

4-4. Selective Call (SELCALL)

This is a voice call to a particular individual or group of stations.

■ Example of call types;

[100][ALL] : <Group Call>
All the units whose fleet number is "100" are called.
[100][1000] : <Individual Call>
The unit, whose the fleet number is "100" and ID number is "1000", is called.
[ALL][ALL] : <Broadcast Call>
All the units are called.
[ALL][1000] : <Supervisor Call>
All ID "1000" are called regardless of their fleet number.

■ Unit ID Encode Block

Encode ID Block can be set to limit manual dial ID. The radio unit will not accept an ID other than these IDs which are entered from the keypad. If Inter-fleet Call is enabled, block ID setting affects each fleet group.

4-5. Status Message

Using a 2-digit number, you can send and receive a Status message which may be decided in your talk group. Each Status may be displayed with 16 alphanumeric characters if programmed in the radio. A maximum of 9 received messages can be stored in the stack memory, and it can be reviewed after reception. If the message memory becomes full, the oldest one will be erased. The stack memory will be cleared by turning radio power off.

■ Status 80~99 (Special)

Status numbers from 80 to 99 are reserved for special purposes. Entering these statuses from the DTMF keypad can be inhibited.

Please notice that the following status numbers are used for special purposes;

80~89 : Reserved for future use.
90 : Remote stun on. Disable the received radio unit's TX.
91 : Remote stun on. Disable the received radio unit's TX/RX.
92 : Cancel remote stun. Enable the received radio unit's TX/RX.
93 : Acknowledgement status sent when the radio unit is in stun mode (TX disabled).
94 : Acknowledgement status sent when the radio unit is in stun mode (TX/RX disabled).
95~98 : Reserved for future use.
99 : Emergency Status.

Note : Remote stun works with DTMF D.B.D. function also.

■ Automatic Status Response

If you pre-select a status number and leave the radio in the Status Mode, it can automatically respond with the selected status number upon request from the base station. (The request function is initiated by serial control on the base station (Optional).)

4-6. Short Messase (Optional)

A maximum of 48 characters can be sent (External equipment is required). Received Short Messages will be displayed in the same manner as a Status Message. A maximum of 4 received messages can be stored in the stack memory. In the Stack Mode, 3-digit LCD indicates the received Short Message as "M01"~"M04".

4-7. Long Message

A maximum of 1024 characters can be sent (External equipment is required). Received Long Message will not be displayed or stacked in the radio memory but is output through the COM (Data) port.

4-8. Emergency Function

Emergency status 99 will be sent at the beginning of each emergency transmission.

OPERATING FEATURES

■ **Emergency Status response**

"Alert" can be selected for the called radio unit's response to reception of status 99 which is used as an emergency status.

4-9. Other Functions

■ **Manual Dial**

Fleet, ID and Status numbers can be entered from DTMF keypad.

■ **Data TX with QT/DQT**

Whether programmed QT/DQT is modulated or not with a data transmission except for Selcall. A radio unit can receive a data message regardless of QT/DQT if the receiving unit is not scanning.

■ **DMS Baud Rate**

MSK data baud rate setting. The same rate must be set as a communication partner.

1200bps :

Data communication is made in 1200bps. The communication area is much wider than 2400bps. Recommended for repeater operation.

2400bps :

Data communication is made in 2400bps. The communication area is narrower than 1200bps, but it will decrease the data traffic. Data rate 2400bps may not work properly depending on the repeater's characteristic.

■ **Inter-fleet call**

Inter-Fleet Calls allow a radio of one Fleet number to call a radio with a different Fleet number (radio users can manually dial a Unit ID with a different Fleet number).

■ **Status/Short/Long Message on Data Group/ Channel**

Status/Short/Long Message transmission is made whether on the Data System/Group.

■ **Status/Short/Unit ID Message Serial Output**

Whether a received Status/Short message or PTT ID is outputed or not to serial port.

4-10. Parameters

■ **GTC Count**

Number of "Go To data Channel" messages to be sent before transmitting a data message if it is being made on Data System/Group. If a radio unit receives a GTC message, it will move to the Data System/Group of the current system. Increase this item to make sure the called radio unit moves to the Data System/Group.

■ **Random Access (Contention)**

When a channel is busy, radio unit will not transmit (depending on its Busy Channel Lockout setting). As soon as a channel is cleared, some transmissions may crash. Random access is used to avoid this by employing a random transmission sequence.

■ **Number of Retries**

Number of Retries is the maximum number of retry transmission when no acknowledgement is received in the Maximum ACK Wait Time. Increase this item to improve data communication reliability.

■ **TX Busy Wait Time**

TX Busy Wait Time is the maximum amount of time before giving up the data transmission when the channel is busy. Also, this timer affects if it expires during Random Access period.

■ **Maximum ACK Wait Time**

Maximum ACK Wait Time is the maximum amount of time to wait for an acknowledgement from the called radio unit. It is used as an interval time of retries. It must be set greater than the ACK Delay Time of the called radio unit.

■ **ACK Delay Time**

ACK Delay Time is the amount of time from the end of receiving a data to the beginning of sending an acknowledgement. It should be adjusted as the repeater's hang-up delay time. Also, it must be set less than the Maximum ACK Wait Time of the calling radio unit.

■ **TX Delay Time (RX Capture)**

TX Delay Time is the amount of unmodulated transmission to let the called unit stop scanning or exit its battery save mode. It is used only when starting a data communication sequence.

■ **Data TX Modulation Delay Time**

Data TX Modulation Delay Time is the amount of time from the beginning of transmission to the beginning of a data modulation. It is used every time data is transmitted.

REALIGNMENT

1. PC Mode

1-1. Preface

The TK-480 transceiver is programmed by using a personal computer, programming interface (KPG-36) and programming software (KPG-49D (M2) ver 6.30 or later).

The programming software can be used with an IBM PC or compatible. Figure 1 shows the setup of an IBM PC for programming.

1-2. Connection procedure

1. Connect the TK-480 to the personal computer with the interface cable.
2. When the POWER switch on, user mode can be entered immediately. When PC sends command the radio enter PC mode, and "PROGRAM" is displayed on the LCD.
   When data transmitting from transceiver, the red LED is blinking.
   When data receiving to transceiver, the green LED is blinking.

Notes:

- The data stored in the personal computer must match model type, when it is written into the flash memory.
- Change the TK-480 to PC mode, then attach the interface cable.

1-3. KPG-36 description (PC programming interface cable: Option)

The KPG-36 is required to interface the TK-480 to the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-36 connects the universal connector of the TK-480 to the computers RS-232C serial port.

1-4. Programming software description

The KPG-49D (M2) ver 6.30 or later programming disk is supplied in 3-1/2" disk format. The software on this disk allows a user to program TK-480 radio via programming interface cable (KPG-36).

1-5. Programming with IBM PC

If data is transferred to the transceiver from an IBM PC with the KPG-49D (M2) ver 6.30 or later, the destination data (basic radio information) for each set can be modified. Normally, it is not necessary to modify the destination data because their values are determined automatically when the frequency range (frequency type) is set.

The values should be modified only if necessary. Data can be programmed into the flash memory in RS-232C format via the universal connector.

KPG-49D (M2) instruction manual parts No. : B62-1358-XX

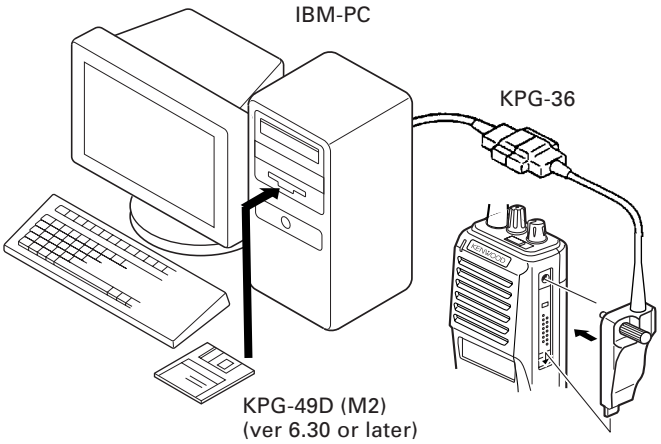


Fig. 1

2. Firmware Programming Mode

2-1. Preface

Flash memory is mounted on the TK-480. This allows the TK-480 to be upgraded when new features are released in the future. (For details on how to obtain the firmware, contact Customer Service.)

2-2. Connection procedure

Connect the TK-480 to the personal computer (IBM PC or compatible) with the interface cable (KPG-36). (Connection is the same as in the PC Mode.)

2-3. Programming

1. Start up the programming software (KPG-49D (M2) ver 6.30 or later), select "firmware program" in the "Program" item, and press the Return key on the personal computer. This starts up the firmware programmer.
2. The top screen is displayed. Press any key to advance to the next screen.
3. Set the communications speed (normally, 57600 bps) and communications port in the Setup item.
4. Set the firmware to be updated by File select (=F1).
5. Turn the TK-480 power ON with the [S] switch held down. Hold the switch down for two seconds until the display changes to "PROG 57600". When "PROG 57600" appears, release your finger from the switch.
6. Check the connection between the TK-480 and the personal computer, and make sure that the TK-480 is in the Program mode.
7. Press F10 on the personal computer. A window opens on the display to indicate progress of writing. When the TK-480 start to receive data. the [P] icon is blinking.
8. If writing ends successfully, the LED on the TK-480 light and the checksum is displayed.
9. If you want to continue programming other TK-480, repeat steps 5 to 8.

REALIGNMENT

Notes:

- To start the Firmware Programmer from KPG-49D (M2) ver 6.30 or later, the Fpro path must be set up by KPG-49D (M2) (ver 6.30 or later) Setup.
- This mode cannot be entered if the Firmware Programming mode is set to Disable in the Programming software (KPG-49D (M2) ver 6.30 or later).
- When programming the firmware, it is recommend to copy the data from the floppy disk to your hard disk before update the radio firmware.
  Directry copying from the floppy disk to the radio may not work because the access speed is too slow.

2-4. Function

1. If you press the [MON] switch (top of left side) while "PROG 57600" is displayed, the checksum is displayed. If you press the [MON] switch again while the checksum is displayed, "PROG 57600" is redisplayed.
2. If you press the [LAMP] switch (bottom of left side) while "PROG 57600" is displayed, the display changes to "PROG 19200" to indicate that the write speed is low speed (19200 bps). If you press the [LAMP] switch again while "PROG 19200" is displayed, the display changes to "PROG 38400", and the write speed becomes the middle-speed mode (38400 bps). If you press the [LAMP] switch again while "PROG 38400" is displayed, the display returns to "PROG 57600".

Note:

Normally, write in the high-speed mode.

PARTS LIST

✻ New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L : Scandinavia **K**: USA **P** : Canada
Y: PX (Far East, Hawaii) **T**: England **E** : Europe
Y: AAFES (Europe) **X**: Australia **M**: Other Areas

TK-480 (Y50-4790-21)
DISPLAY UNIT (X54-3210-11)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-480					
1	1A		A02-3659-13	CABINET ASSY (16KEY)	
2	2B		A62-0981-04	PANEL ASSY	
4	2C		B09-0363-03	CAP (SP/MIC) ACSY	
5	2A	✻	B38-0892-05	LCD ASSY	
6	1B		B43-1139-04	BADGE (KENWOOD)	
9	2C	✻	B62-1771-00	INSTRUCTION MANUAL	
10	3A	✻	B72-2244-04	MODEL NAME PLATE	
12	3B		E04-0406-05	RF COAXIAL RECEPTACLE (SMA)	
15	2B		E23-1049-04	TERMINAL (ANT)	
51	3A		E23-1166-04	RELAY TERMINAL	
16	2A		E37-0672-05	FLAT CABLE (CONT-TX-RX)	
17	3A		E37-0673-05	LEAD WIRE WITH CONNECTOR (PTT)	
18	1A		E37-0674-15	LEAD WIRE WITH CONNECTOR (SP)	
19	3B		E58-0440-05	SQUARE SOCKET (SP/MIC)	
52	3A		E72-0412-13	TERMINAL BLOCK	
54	2A		F10-2248-13	SHIELDING CASE (VCO)	
55	2A		F10-2253-03	SHIELDING PLATE (BAND PASS)	
56	2A		F10-2255-04	SHIELDING PLATE (P-MODULE)	
57	2A		F10-2310-03	SHIELDING PLATE (LCD)	
-			F20-1192-04	INSULATING SHEET	
-			F20-3303-04	INSULATING SHEET (MIC/GND)	
21	1A		G01-0881-04	COIL SPRING	
22	1B		G09-0418-05	KNOB SPRING (VOL,ENC)	
23	1B		G10-0799-04	FIBROUS SHEET (SP)	
24	3A		G11-0800-04	SHEET (PTT)	
61	3A		G11-2544-04	SHEET (CHASSIS)	
62	2A		G13-1731-04	CUSHION (LCD)	
63	3A,3B		G13-1762-04	CUSHION (VOL/CHASSIS)	
64	3A		G13-1834-04	CUSHION (TERMINAL)	
26	3B		G53-0811-03	PACKING (TOP)	
25	1A		G53-0841-02	PACKING (16KEY)	
65	3A		G53-1510-04	PACKING (BATT+)	
66	3A		G53-1520-24	PACKING (TERMINAL)	
67	3B		G53-1619-04	PACKING (SMA)	
28	2D		H12-3014-02	PACKING FIXTURE	
29	3D		H52-1096-12	ITEM CARTON CASE	
31	1A		J19-1572-04	HOLDER	
68	2A		J21-8321-03	HARDWARE FIXTURE (P-MODULE)	
32	2C		J29-0658-05	HOOK ACSY	
33	3B		J82-0045-05	FPC (VOL,ENC)	
34	3B		J82-0046-05	FPC (SOCKET)	
38	1B		K29-5157-03	KNOB (PTT)	
39	1B		K29-5158-03	KEY TOP (PTT)	
40	1A		K29-5165-03	LEVER KNOB	
36	1B		K29-5231-03	KNOB (VOL)	
37	1B		K29-5232-03	KNOB (ENC)	
A	2B		N14-0809-04	CIRCULAR NUT (VOL,ENC)	
B	3B		N30-2605-46	PAN HEAD MACHINE SCREW (ANT)	
C	3A		N30-2610-46	PAN HEAD MACHINE SCREW (CASE)	
D	2A		N67-2606-46	PAN HEAD SEMS SCREW W (P-MODULE)	
F	3A		N79-2025-46	PAN HEAD TAPTITE SCREW (TERMINAL)	
E	2A,1B		N83-2005-46	PAN HEAD TAPTITE SCREW (UNIT)	
42	2C		N99-2004-05	SCREW SET ACSY	
44	3B		R31-0617-05	VARIABLE RESISTOR (POWER SW/VOL)	
S300	-		S70-0414-05	TACT SWITCH	
46	1A		T07-0714-05	SPEAKER	
47	2C		T90-0636-25	WHIP ANTENNA (800MHZ) ACSY	
MIC300	1A		T91-0579-05	MIC ELEMENT	
49	2B		W02-1814-05	ENCODER	
50	1D		W09-0900-45	BATTERY ASSY ACSY	
DISPLAY UNIT (X54-3210-11)					
D301			B30-2019-05	LED (RE/GR) (BUSY/TX)	
D305-310			B30-2171-05	LED (BACKLIGHT)	
D305,306			B30-2171-05	LED (BACKLIGHT)	
C301			CC73GCH1H470J	CHIP C 47PF J	
C302			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C304			CK73FB1C474K	CHIP C 0.47UF K	
C305			CC73GCH1H101J	CHIP C 100PF J	
C307			CK73GB1C104K	CHIP C 0.10UF K	
C308			CC73GCH1H101J	CHIP C 100PF J	
C309			CK73FB1C474K	CHIP C 0.47UF K	
C310			CK73GB1C104K	CHIP C 0.10UF K	
C311			CC73GCH1H470J	CHIP C 47PF J	
C312			CK73GB1C104K	CHIP C 0.10UF K	
C313			C92-0628-05	CHIP-TAN 10UF 10WV	
C314			C92-0647-05	CHIP-TAN 3.3UF 4WV	
C315			CC73GCH1H101J	CHIP C 100PF J	
C316,317			CC73GCH1H470J	CHIP C 47PF J	
C318			CC73GCH1H101J	CHIP C 100PF J	
C321-333			CC73GCH1H470J	CHIP C 47PF J	
C335-339			CC73GCH1H470J	CHIP C 47PF J	
C340			CK73GB1E153K	CHIP C 0.015UF K	
C341-344			CC73GCH1H470J	CHIP C 47PF J	
CN300			E40-5891-05	FLAT CABLE CONNECTOR (24P)	
CN301			E40-5892-05	FLAT CABLE CONNECTOR (14P)	
CN302			E40-5662-05	PIN ASSY SOCKET (SP)	
CN303			E40-5887-05	PIN ASSY (PTT)	
CN304			E40-5823-05	FLAT CABLE CONNECTOR (LCD)	
L300,301			L92-0141-05	FERRITE CHIP	
L302,303			L92-0138-05	FERRITE CHIP	
L304,305			L92-0141-05	FERRITE CHIP	
L306,307			L92-0138-05	FERRITE CHIP	
L308,309			L92-0141-05	FERRITE CHIP	
CP300,301			R90-0723-05	MULTI-COMP 47K X2	
CP302			R90-0724-05	MULTI-COMP 1K X4	
CP303			R90-0724-05	MULTI-COMP 1K X4	
R300			RK73GB1J103J	CHIP R 10K J 1/16W	
R301			RK73FB2A101J	CHIP R 100 J 1/10W	
R302			RK73GB1J470J	CHIP R 47 J 1/16W	
R303			RK73GB1J471J	CHIP R 470 J 1/16W	
R304			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R305			RK73GB1J104J	CHIP R 100K J 1/16W	
R306			R92-1252-05	CHIP R 0 OHM	

PARTS LIST

DISPLAY UNIT (X54-3210-11)
TX-RX UNIT (X57-5630-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R307			RK73GB1J821J	CHIP R 820 J 1/16W	
R308			RK73GB1J153J	CHIP R 15K J 1/16W	
R309			R92-1252-05	CHIP R 0 OHM	
R310			RK73GB1J331J	CHIP R 330 J 1/16W	
R311			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R312			RK73GB1J104J	CHIP R 100K J 1/16W	
R313,314			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R315			RK73GB1J104J	CHIP R 100K J 1/16W	
R316			RK73GB1J473J	CHIP R 47K J 1/16W	
R317			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R318			RK73GB1J104J	CHIP R 100K J 1/16W	
R319			RK73GB1J820J	CHIP R 82 J 1/16W	
R320,321			RK73GB1J820J	CHIP R 82 J 1/16W	
R324			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R325			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R326			RK73GB1J124J	CHIP R 120K J 1/16W	
R327			RK73GB1J563J	CHIP R 56K J 1/16W	
R328			RK73GB1J124J	CHIP R 120K J 1/16W	
R331			RK73GB1J103J	CHIP R 10K J 1/16W	
R332			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R333			RK73GB1J103J	CHIP R 10K J 1/16W	
R336			R92-1252-05	CHIP R 0 OHM	
R337			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R338-341			RK73GB1J101J	CHIP R 100 J 1/16W	
S301-303			S70-0457-05	TACT SWITCH (PTT)	
D300			NNCD6.8G	ZENER DIODE	
D302			1SS373	DIODE	
D303			015AZ2.4-X	ZENER DIODE	
D304			MA2S111	DIODE	
D315			IMN10	DIODE	
D316			MA2S111	DIODE	
D317			MA2S111	DIODE	
D318			IMN10	DIODE	
D319-321			015AZ6.8	ZENER DIODE	
IC300			TDA7053AT	IC (AUDIO AMP)	
IC301			TC74HC4017AF	IC (COUNTER)	
Q300			2SJ243	FET	
Q301			UPA672T	FET	
Q302-304			2SC4617(S)	TRANSISTOR	
Q305			2SB798(DL,DK)	TRANSISTOR	
Q306			2SC4617(S)	TRANSISTOR	
Q307			2SB1132(Q,R)	TRANSISTOR	
Q308			UPA672T	FET	
Q309			2SC4617(S)	TRANSISTOR	
Q310			2SK1824	FET	
TH300			TN10-3S154JT	THERMISTOR	

TX-RX UNIT (X57-5630-10)

C1,2			CK73GB1E103K	CHIP C 0.010UF K	
C3,4			CC73GCH1H101J	CHIP C 100PF J	
C5			CK73GB1E103K	CHIP C 0.010UF K	
C6			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C7			CC73GCH1H101J	CHIP C 100PF J	
C8			CK73GB1E223K	CHIP C 0.022UF K	
C9			CK73GB1C104K	CHIP C 0.10UF K	
C10			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C11			CK73GB1C104K	CHIP C 0.10UF K	
C12,13			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C14			C92-0576-05	CHIP-TAN 1.0UF 6.3WV	
C15			CC73GCH1H100D	CHIP C 10PF D	
C16,17			CC73GCH1H101J	CHIP C 100PF J	
C18			CK73GB1C104K	CHIP C 0.10UF K	
C19-23			CC73GCH1H101J	CHIP C 100PF J	
C24			C92-0507-05	CHIP-TAN 4.7UF 6.3WV	
C25			CK73FB1A105K	CHIP C 1.0UF K	
C26			CK73GB1E123K	CHIP C 0.012UF K	
C27			CK73GB1C104K	CHIP C 0.10UF K	
C28-30			CC73GCH1H101J	CHIP C 100PF J	
C31			CK73GB1C104K	CHIP C 0.10UF K	
C32			CK73GB1H472K	CHIP C 4700PF K	
C33			CK73GB1H471K	CHIP C 470PF K	
C34			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C35			CK73GB1C333K	CHIP C 0.033UF K	
C36			CC73GCH1H820J	CHIP C 82PF J	
C37			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C38			CC73GCH1H101J	CHIP C 100PF J	
C39			CC73GCH1H221J	CHIP C 220PF J	
C40			CC73GCH1H101J	CHIP C 100PF J	
C41			CK73FB1C334K	CHIP C 0.33UF K	
C42			CK73GB1E103K	CHIP C 0.010UF K	
C43			C92-0513-05	CHIP-TAN 3.3UF 6.3WV	
C44			C92-0662-05	CHIP-TAN 15UF 6.3WV	
C45			CC73GCH1H220J	CHIP C 22PF J	
C46			CC73GCH1H221J	CHIP C 220PF J	
C47			CK73GB1E223K	CHIP C 0.022UF K	
C48			CC73GCH1H220J	CHIP C 22PF J	
C49,50			CK73GB1H102K	CHIP C 1000PF K	
C51			CK73GB1E223K	CHIP C 0.022UF K	
C52-54			CK73GB1H102K	CHIP C 1000PF K	
C55			CC73GCH1H150J	CHIP C 15PF J	
C56			CK73GB1H222K	CHIP C 2200PF K	
C57			CK73GB1E153K	CHIP C 0.015UF K	
C58			CK73GB1C104K	CHIP C 0.10UF K	
C59			CC73GCH1H101J	CHIP C 100PF J	
C60			CC73GCH1H100D	CHIP C 10PF D	
C62			CK73GB1E103K	CHIP C 0.010UF K	
C63			CC73GCH1H101J	CHIP C 100PF J	
C64			CC73GCH1H271J	CHIP C 270PF J	
C65			CK73GB1H103K	CHIP C 0.010UF K	
C66			CK73GB1C104K	CHIP C 0.10UF K	
C67			CK73GB1H122J	CHIP C 1200PF J	
C69			C92-0559-05	CHIP-TAN 6.8UF 6.3WV	
C70-72			CK73GB1E103K	CHIP C 0.010UF K	
C73			CC73GCH1H101J	CHIP C 100PF J	
C74			CK73GB1C104K	CHIP C 0.10UF K	
C75			CK73GB1C333K	CHIP C 0.033UF K	
C76			CK73GB1C104K	CHIP C 0.10UF K	
C77			CK73GB1H562J	CHIP C 5600PF J	
C78			CK73GB1E103K	CHIP C 0.010UF K	
C79			CC73GCH1H121J	CHIP C 120PF J	
C80			CK73GB1C683K	CHIP C 0.068UF K	
C81			CC73GCH1H101J	CHIP C 100PF J	
C82,83			CK73GB1H562J	CHIP C 5600PF J	
C84			CC73GCH1H150J	CHIP C 15PF J	
C85			CK73GB1H272J	CHIP C 2700PF J	
C86			CK73GB1C333K	CHIP C 0.033UF K	
C87			CC73GCH1H030C	CHIP C 3.0PF C	
C88			CC73GCH1H101J	CHIP C 100PF J	

PARTS LIST

TX-RX UNIT (X57-5630-10)

Ref. No.	Address	New parts	Parts No.	Description			Destination
C89,90			CK73GB1H272J	CHIP C	2700PF	J	
C91			CK73GB1E103K	CHIP C	0.010UF	K	
C92			CK73GB1C104K	CHIP C	0.10UF	K	
C93			CC73GCH1H151J	CHIP C	150PF	J	
C94			CC73GCH1H101J	CHIP C	100PF	J	
C95			C92-0504-05	CHIP-TAN	0.68UF	20WV	
C96			CK73GB1H122K	CHIP C	1200PF	K	
C97			CK73GB1H102K	CHIP C	1000PF	K	
C98			CC73GCH1H030C	CHIP C	3.0PF	C	
C99			CC73GCH1H1R5B	CHIP C	1.5PF	B	
C100			CC73GCH1H391J	CHIP C	390PF	J	
C101			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C102			CK73GB1C104K	CHIP C	0.10UF	K	
C103,104			CC73GCH1H101J	CHIP C	100PF	J	
C105			CK73GB1C473K	CHIP C	0.047UF	K	
C106-108			CK73GB1C104K	CHIP C	0.10UF	K	
C109			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C110			CC73GCH1H1R5B	CHIP C	1.5PF	B	
C111,112			CK73GB1C104K	CHIP C	0.10UF	K	
C113			CK73GB1C473K	CHIP C	0.047UF	K	
C114,115			CK73GB1H472K	CHIP C	4700PF	K	
C116			CK73GB1H102K	CHIP C	1000PF	K	
C117			CC73GCH1H470J	CHIP C	47PF	J	
C118			CK73GB1E103K	CHIP C	0.010UF	K	
C119			CC73GCH1HR75C	CHIP C	0.75PF	C	
C120			CC73GCH1H101J	CHIP C	100PF	J	
C121			CK73GB1E153K	CHIP C	0.015UF	K	
C122			CC73GCH1H1R5C	CHIP C	1.5PF	C	
C123			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C124			CK73GB1E103K	CHIP C	0.010UF	K	
C125			CK73GB1H102K	CHIP C	1000PF	K	
C126			CK73GB1C104K	CHIP C	0.10UF	K	
C127-129			CC73GCH1H101J	CHIP C	100PF	J	
C130			CC73GCH1H100D	CHIP C	10PF	D	
C131			CC73GCH1H101J	CHIP C	100PF	J	
C132			CC73GCH1H010C	CHIP C	1.0PF	C	
C133			CC73GCH1H101J	CHIP C	100PF	J	
C134			CC73GCH1H010B	CHIP C	1.0PF	B	
C135			CC73GCH1H101J	CHIP C	100PF	J	
C136			CC73GCH1H030C	CHIP C	3.0PF	C	
C137			CC73GCH1H101J	CHIP C	100PF	J	
C138			CK73GB1E103K	CHIP C	0.010UF	K	
C139			CC73GCH1H030C	CHIP C	3.0PF	C	
C140			CK73FB1A105K	CHIP C	1.0UF	K	
C141			CK73GB1H472K	CHIP C	4700PF	K	
C142,143			CC73GCH1H101J	CHIP C	100PF	J	
C144			CK73GB1C273K	CHIP C	0.027UF	K	
C145,146			CC73GCH1H101J	CHIP C	100PF	J	
C147,148			CK73HB1C103K	CHIP C	0.010UF	K	
C149			CC73GCH1H040C	CHIP C	4.0PF	C	
C150,151			CC73GCH1H101J	CHIP C	100PF	J	
C152			CC73GCH1H020C	CHIP C	2.0PF	C	
C153			CC73GCH1H101J	CHIP C	100PF	J	
C154			CK73GB1C104K	CHIP C	0.10UF	K	
C155			CC73GCH1H101J	CHIP C	100PF	J	
C156			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C157			CC73GCH1H680J	CHIP C	68PF	J	
C158			CC73GCH1H270J	CHIP C	27PF	J	
C159			CK73FB1H563K	CHIP C	0.056UF	K	
C160,161			CC73GCH1H101J	CHIP C	100PF	J	

Ref. No.	Address	New parts	Parts No.	Description			Destination
C162			CC73GCH1H270J	CHIP C	27PF	J	
C163			CK73FB1C474K	CHIP C	0.47UF	K	
C164,165			CC73GCH1H101J	CHIP C	100PF	J	
C166			CC73GCH1H010C	CHIP C	1.0PF	C	
C167			CC73GCH1H101J	CHIP C	100PF	J	
C168			CC73GCH1H020C	CHIP C	2.0PF	C	
C169-172			CC73GCH1H101J	CHIP C	100PF	J	
C173			CC73GCH1H020C	CHIP C	2.0PF	C	
C174			CC73GCH1H1R5C	CHIP C	1.5PF	C	
C175			CC73GCH1H030C	CHIP C	3.0PF	C	
C176			CC73GCH1H010C	CHIP C	1.0PF	C	
C177			CK73GB1C473K	CHIP C	0.047UF	K	
C178-180			CC73GCH1H101J	CHIP C	100PF	J	
C181,182			CK73GB1E103K	CHIP C	0.010UF	K	
C183			CC73GCH1H101J	CHIP C	100PF	J	
C184			CC73GCH1H030C	CHIP C	3.0PF	C	
C185			CC73GCH1H101J	CHIP C	100PF	J	
C186			CC73GCH1H1R5C	CHIP C	1.5PF	C	
C187			CC73GCH1H101J	CHIP C	100PF	J	
C188-191			CC73GCH1H470J	CHIP C	47PF	J	
C192			CC73GCH1H101J	CHIP C	100PF	J	
C193			CC73GCH1H020C	CHIP C	2.0PF	C	
C194-199			CC73GCH1H101J	CHIP C	100PF	J	
C200			CK73GB1E103K	CHIP C	0.010UF	K	
C201			CC73GCH1H470J	CHIP C	47PF	J	
C202			CK73GB1E103K	CHIP C	0.010UF	K	
C203			CC73GCH1H470J	CHIP C	47PF	J	
C204			C92-0003-05	CHIP-TAN	0.47UF	25WV	
C205,206			CK73HB1C103K	CHIP C	0.010UF	K	
C207			CK73GB1C104K	CHIP C	0.10UF	K	
C208,209			CC73GCH1H101J	CHIP C	100PF	J	
C261,262			CK73HB1C103K	CHIP C	0.010UF	K	
C263			C92-0628-05	CHIP-TAN	10UF	10WV	
CN1			E40-5823-05	FLAT CABLE CONNECTOR (10P)			
CN2			E40-9517-05	PIN ASSY SOCKET (4P)			
CN3			E40-5890-05	FLAT CABLE CONNECTOR (24P)			
CN4-9			E23-1002-05	TERMINAL			
CN10			E23-0342-05	TEST TERMINAL			
CN11,12			E23-1002-05	TERMINAL			
F1			F53-0130-05	FUSE (3A)			
F1			F53-0217-05	FUSE (3A)			
CD1			L79-1072-05	TUNING COIL			
CF1,2			L72-0924-05	CERAMIC FILTER (455KHZ)			
L1			L92-0149-05	FERRITE CHIP			
L3			L40-1095-34	SMALL FIXED INDUCTOR (1UH)			
L4			L40-4791-37	SMALL FIXED INDUCTOR (4.700UH)			
L5			L92-0138-05	FERRITE CHIP			
L6,7			L40-3985-45	SMALL FIXED INDUCTOR (0.39UH)			
L8			L92-0138-05	FERRITE CHIP			
L9			L40-1075-92	SMALL FIXED INDUCTOR (10NH)			
L10			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)			
L11			L79-1464-05	DIELECTRIC FILTER (860MHZ)			
L12			L92-0138-05	FERRITE CHIP			
L13,14			L40-1075-92	SMALL FIXED INDUCTOR (10NH)			
L15			L40-5663-92	SMALL FIXED INDUCTOR (5.6NH)			
L16			L92-0138-05	FERRITE CHIP			
L17			L40-1075-92	SMALL FIXED INDUCTOR (10NH)			
L18			L40-2275-92	SMALL FIXED INDUCTOR (22NH)			

PARTS LIST

TX-RX UNIT (X57-5630-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
L19			L40-1075-92	SMALL FIXED INDUCTOR (10NH)	
L20			L79-1465-05	DIELECTRIC FILTER (860MHZ)	
L21			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)	
L22,23			L92-0138-05	FERRITE CHIP	
L24			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)	
L25			L92-0149-05	FERRITE CHIP	
L26			L92-0138-05	FERRITE CHIP	
L27			L40-6875-54	SMALL FIXED INDUCTOR (68NH)	
L28			L33-0761-05	SMALL FIXED INDUCTOR	
L29			L40-1075-92	SMALL FIXED INDUCTOR (10NH)	
L30			L79-1468-05	FILTER MODULE (870MHZ)	
L31			L33-0760-05	SMALL FIXED INDUCTOR	
L32			L40-6875-54	SMALL FIXED INDUCTOR (68NH)	
L34			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)	
L35			L92-0138-05	FERRITE CHIP	
L53-56			L92-0138-05	FERRITE CHIP	
X1			L77-1760-15	CRYSTAL RESONATOR (44.395MHZ)	
X2			L77-1699-15	VCXO (16.8MHZ)	
X3			L77-1708-05	CRYSTAL RESONATOR (3.579545MHZ)	
X4			L78-0462-05	RESONATOR (9.8304MHZ)	
XF1			L71-0501-05	MCF (44.85MHZ)	
CP1			R90-0718-05	MULTI-COMP 4.7K X4	
CP3			R90-0743-05	MULTIPLE RESISTOR	
CP5			R90-0743-05	MULTIPLE RESISTOR	
CP6-21			R90-0741-05	MULTIPLE RESISTOR	
CP22			R90-0743-05	MULTIPLE RESISTOR	
CP24			R90-0743-05	MULTIPLE RESISTOR	
R1,2			RK73GB1J104J	CHIP R 100K J 1/16W	
R3			RK73GB1J473J	CHIP R 47K J 1/16W	
R4			RK73GB1J154J	CHIP R 150K J 1/16W	
R5			RK73GB1J104J	CHIP R 100K J 1/16W	
R6			RK73GB1J184J	CHIP R 180K J 1/16W	
R7			RK73GB1J104J	CHIP R 100K J 1/16W	
R8			RK73GB1J183J	CHIP R 18K J 1/16W	
R9			RK73GB1J154J	CHIP R 150K J 1/16W	
R10			RK73GB1J103J	CHIP R 10K J 1/16W	
R11			RK73GB1J473J	CHIP R 47K J 1/16W	
R12			RK73GB1J104J	CHIP R 100K J 1/16W	
R13			RK73GB1J683J	CHIP R 68K J 1/16W	
R14			RK73GB1J394J	CHIP R 390K J 1/16W	
R15			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R16			RK73GB1J104J	CHIP R 100K J 1/16W	
R17			RK73GB1J473J	CHIP R 47K J 1/16W	
R18			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R19			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R20			RK73GB1J683J	CHIP R 68K J 1/16W	
R21			RK73GB1J154J	CHIP R 150K J 1/16W	
R22			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R23			RK73GB1J563J	CHIP R 56K J 1/16W	
R24			RK73GB1J274J	CHIP R 270K J 1/16W	
R25			RK73GB1J473J	CHIP R 47K J 1/16W	
R26			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R27			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R28			RK73GB1J220J	CHIP R 22 J 1/16W	
R29			RK73GB1J183J	CHIP R 18K J 1/16W	
R31			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R32			R92-1252-05	CHIP R 0 OHM	
R33			RK73GB1J123J	CHIP R 12K J 1/16W	
R34			RK73GB1J334J	CHIP R 330K J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R35			RK73GB1J101J	CHIP R 100 J 1/16W	
R36			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R37			RK73GB1J104J	CHIP R 100K J 1/16W	
R38			RK73GB1J151J	CHIP R 150 J 1/16W	
R39			RK73GB1J560J	CHIP R 56 J 1/16W	
R40			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R41			RK73GB1J471J	CHIP R 470 J 1/16W	
R42,43			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R44			R92-0670-05	CHIP R 0 OHM	
R45			RN73GH1J913D	CHIP R 91K D 1/16W	
R46			RN73GH1J683D	CHIP R 68K D 1/16W	
R47			RN73GH1J913D	CHIP R 91K D 1/16W	
R48			RN73GH1J333D	CHIP R 33K D 1/16W	
R49			RK73GB1J684J	CHIP R 680K J 1/16W	
R50			RK73GB1J564J	CHIP R 560K J 1/16W	
R51			RK73GB1J331J	CHIP R 330 J 1/16W	
R53			RN73GH1J274D	CHIP R 270K D 1/16W	
R54			RK73GB1J334J	CHIP R 330K J 1/16W	
R55			RN73GH1J913D	CHIP R 91K D 1/16W	
R56			RK73GB1J223J	CHIP R 22K J 1/16W	
R57			RK73GB1J334J	CHIP R 330K J 1/16W	
R58			RN73GH1J682D	CHIP R 6.8K D 1/16W	
R59			RK73GB1J154J	CHIP R 150K J 1/16W	
R60			RK73GB1J101J	CHIP R 100 J 1/16W	
R61			RK73GB1J155J	CHIP R 1.5M J 1/16W	
R62			RK73GB1J101J	CHIP R 100 J 1/16W	
R63			RN73GH1J683D	CHIP R 68K D 1/16W	
R64			RK73GB1J474J	CHIP R 470K J 1/16W	
R65			RK73GB1J560J	CHIP R 56 J 1/16W	
R66			RN73GH1J682D	CHIP R 6.8K D 1/16W	
R67,68			RK73GB1J101J	CHIP R 100 J 1/16W	
R69			RK73GB1J153J	CHIP R 15K J 1/16W	
R70			RK73GB1J153J	CHIP R 15K J 1/16W	
R71			RK73GB1J224J	CHIP R 220K J 1/16W	
R72			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R73			RK73GB1J103J	CHIP R 10K J 1/16W	
R74			RK73GB1J223J	CHIP R 22K J 1/16W	
R75			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R76			RK73GB1J103J	CHIP R 10K J 1/16W	
R77			RK73GB1J153J	CHIP R 15K J 1/16W	
R78			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R79			RK73GB1J473J	CHIP R 47K J 1/16W	
R80			RK73GB1J394J	CHIP R 390K J 1/16W	
R81			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R82			RK73GB1J333J	CHIP R 33K J 1/16W	
R83			R92-1252-05	CHIP R 0 OHM	
R84			RK73GB1J473J	CHIP R 47K J 1/16W	
R85			RK73GB1J681J	CHIP R 680 J 1/16W	
R86			RK73GB1J154J	CHIP R 150K J 1/16W	
R87			RK73GB1J470J	CHIP R 47 J 1/16W	
R88			RK73GB1J220J	CHIP R 22 J 1/16W	
R89			RK73GB1J103J	CHIP R 10K J 1/16W	
R90			RK73GB1J104J	CHIP R 100K J 1/16W	
R91			RK73GB1J100J	CHIP R 10 J 1/16W	
R92,93			RK73GB1J150J	CHIP R 15 J 1/16W	
R94			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R95			RK73GB1J150J	CHIP R 15 J 1/16W	
R96			RK73GB1J223J	CHIP R 22K J 1/16W	
R97			RK73GB1J104J	CHIP R 100K J 1/16W	
R98			RK73GB1J184J	CHIP R 180K J 1/16W	

PARTS LIST

TX-RX UNIT (X57-5630-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R99			RK73GB1J121J	CHIP R 120 J 1/16W	
R100			RK73GB1J820J	CHIP R 82 J 1/16W	
R101			RK73GB1J223J	CHIP R 22K J 1/16W	
R102			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R103			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R104			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R105			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R106			RK73GB1J473J	CHIP R 47K J 1/16W	
R107			RK73GB1J103J	CHIP R 10K J 1/16W	
R108			RK73GB1J682J	CHIP R 6.8K J 1/16W	
R109			RK73GB1J470J	CHIP R 47 J 1/16W	
R110			RK73GB1J473J	CHIP R 47K J 1/16W	
R111			RK73GB1J223J	CHIP R 22K J 1/16W	
R112			RK73GB1J103J	CHIP R 10K J 1/16W	
R113			RK73GB1J101J	CHIP R 100 J 1/16W	
R114			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R115			RK73GB1J681J	CHIP R 680 J 1/16W	
R116			R92-1368-05	CHIP R 0 OHM	
R117			RK73GB1J470J	CHIP R 47 J 1/16W	
R118			R92-1252-05	CHIP R 0 OHM	
R120			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R121			RK73GB1J473J	CHIP R 47K J 1/16W	
R122			R92-1252-05	CHIP R 0 OHM	
R123			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R124,125			RK73HB1J473J	CHIP R 47K J 1/16W	
R126			RK73GB1J103J	CHIP R 10K J 1/16W	
R127-129			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R130-135			RN73GH1J154D	CHIP R 150K D 1/16W	
R136,137			RK73GB1J271J	CHIP R 270 J 1/16W	
R138			RK73HB1J103J	CHIP R 10K J 1/16W	
R139			R92-1368-05	CHIP R 0 OHM	
R140			RK73GB1J103J	CHIP R 10K J 1/16W	
R141,142			RK73GB1J104J	CHIP R 100K J 1/16W	
R143			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R144			RK73GB1J473J	CHIP R 47K J 1/16W	
R145			R92-1252-05	CHIP R 0 OHM	
R146			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R147			R92-1252-05	CHIP R 0 OHM	
R148			RK73GB1J223J	CHIP R 22K J 1/16W	
R149			RK73HB1J473J	CHIP R 47K J 1/16W	
R150			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R151			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R152			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R153			RK73GB1J123J	CHIP R 12K J 1/16W	
R154			RK73GB1J221J	CHIP R 220 J 1/16W	
R155			RK73GB1J101J	CHIP R 100 J 1/16W	
R156			RK73GB1J103J	CHIP R 10K J 1/16W	
R157			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R158			RK73GB1J223J	CHIP R 22K J 1/16W	
R159,160			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R161,162			RK73GB1J184J	CHIP R 180K J 1/16W	
R163			RK73GB1J104J	CHIP R 100K J 1/16W	
R164			RK73GB1J473J	CHIP R 47K J 1/16W	
R165			RK73GB1J150J	CHIP R 15 J 1/16W	
R167			RK73GB1J123J	CHIP R 12K J 1/16W	
R168			RK73GB1J333J	CHIP R 33K J 1/16W	
R169			RK73GB1J223J	CHIP R 22K J 1/16W	
R170			RK73GB1J473J	CHIP R 47K J 1/16W	
R171			RK73GB1J823J	CHIP R 82K J 1/16W	
R200-207			RK73HB1J102J	CHIP R 1.0K J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R211			RK73HB1J103J	CHIP R 10K J 1/16W	
R218			RK73HB1J473J	CHIP R 47K J 1/16W	
R248			R92-1252-05	CHIP R 0 OHM	
R250			R92-1252-05	CHIP R 0 OHM	
R259			R92-1252-05	CHIP R 0 OHM	
R276			R92-1252-05	CHIP R 0 OHM	
R297,298			RK73HB1J473J	CHIP R 47K J 1/16W	
R408			RK73HB1J473J	CHIP R 47K J 1/16W	
R417			RK73GB1J474J	CHIP R 470K J 1/16W	
R418			RK73GB1J104J	CHIP R 100K J 1/16W	
R419-422			R92-1252-05	CHIP R 0 OHM	
R423			RK73GB1J473J	CHIP R 47K J 1/16W	
D1			1SR154-400	DIODE	
D2			MA2S111	DIODE	
D3			MA742	DIODE	
D4,5			MA2S077	DIODE	
D6			UDZS4.7B	ZENER DIODE	
D7			HVU131	DIODE	
D8			MA2S111	DIODE	
D9,10			MA2S077	DIODE	
D11			MA742	DIODE	
D17,18			DA221	DIODE	
IC1			TA75W01FU	IC (BUFFER AMP)	
IC2			RN5VL42C	IC (VOLTAGE DETECTOR/RESET)	
IC3			TC75W51FU	IC (SUMMING AMP)	
IC4			M62364FP	IC (D/A CONVERTER)	
IC5			S-81350HG-KD	IC (VOLTAGE REGULATOR/5M)	
IC6			NJU7201U50	IC (VOLTAGE REGULATOR/5V)	
IC7			TK11250BM	IC (VOLTAGE REGULATOR/5C)	
IC8			TC75W51FU	IC (BUFFER AMP)	
IC9			TA31136FN	IC (FM IF SYSTEM)	
IC10			TA75W01FU	IC (ACTIVE FILTER)	
IC11			SA7025DK	IC (PLL SYSTEM)	
IC12			TC35453F	IC (AUDIO PROCESSOR)	
IC13			LC73872M	IC (DTMF DECODER)	
IC14			KCH31	HIC (VCO SYSTEM)	
IC15			30622M8A-4F9GP	IC (MICROPROCESSOR)	
IC16			AT2408N10SI2.5	IC (EEPROM)	
IC17			AT29C020-90TI	IC (AND GATE)	
IC17			W29C020C90	IC (AND GATE)	
IC18,19			BU4094BCFV	IC (SHIFT REGISTER)	
IC21			NJM2904V	IC (COMPARATOR)	
IC23			TA75S01F	IC (ACTIVE FILTER)	
IC30			M68757L	IC (POWER MODULE)	
Q1			2SJ243	FET	
Q2			2SA1832(GR)	TRANSISTOR	
Q3,4			2SC4617(S)	TRANSISTOR	
Q5			2SC4619	TRANSISTOR	
Q6			3SK318	FET	
Q7			2SK1824	FET	
Q8			2SC5108(Y)	TRANSISTOR	
Q9			3SK274	FET	
Q10,11			2SC5108(Y)	TRANSISTOR	
Q12			2SC4988	TRANSISTOR	
Q13			2SK1824	FET	
Q14			DTC114EE	DIGITAL TRANSISTOR	
Q15			DTA144EE	DIGITAL TRANSISTOR	
Q16			DTC114EE	DIGITAL TRANSISTOR	
Q17			2SC5108(Y)	TRANSISTOR	

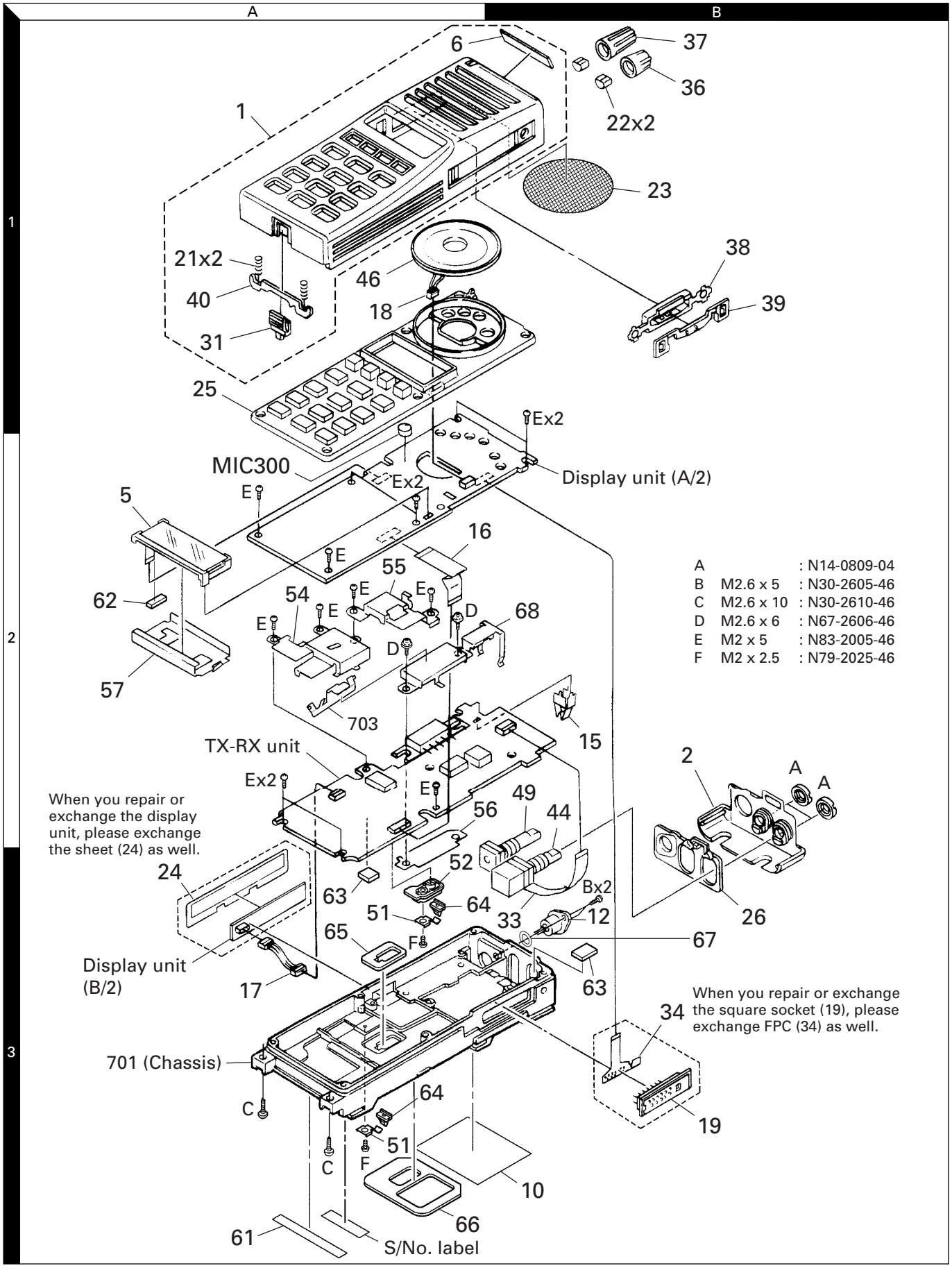
PARTS LIST

TX-RX UNIT (X57-5630-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
Q18			2SK1824	FET	
Q19			2SC4617(S)	TRANSISTOR	
Q20			DTC144EE	DIGITAL TRANSISTOR	
Q21-23			2SK1824	FET	
TH2			157-503-65001	THERMISTOR	

Ref. No.	Address	New parts	Parts No.	Description	Destination

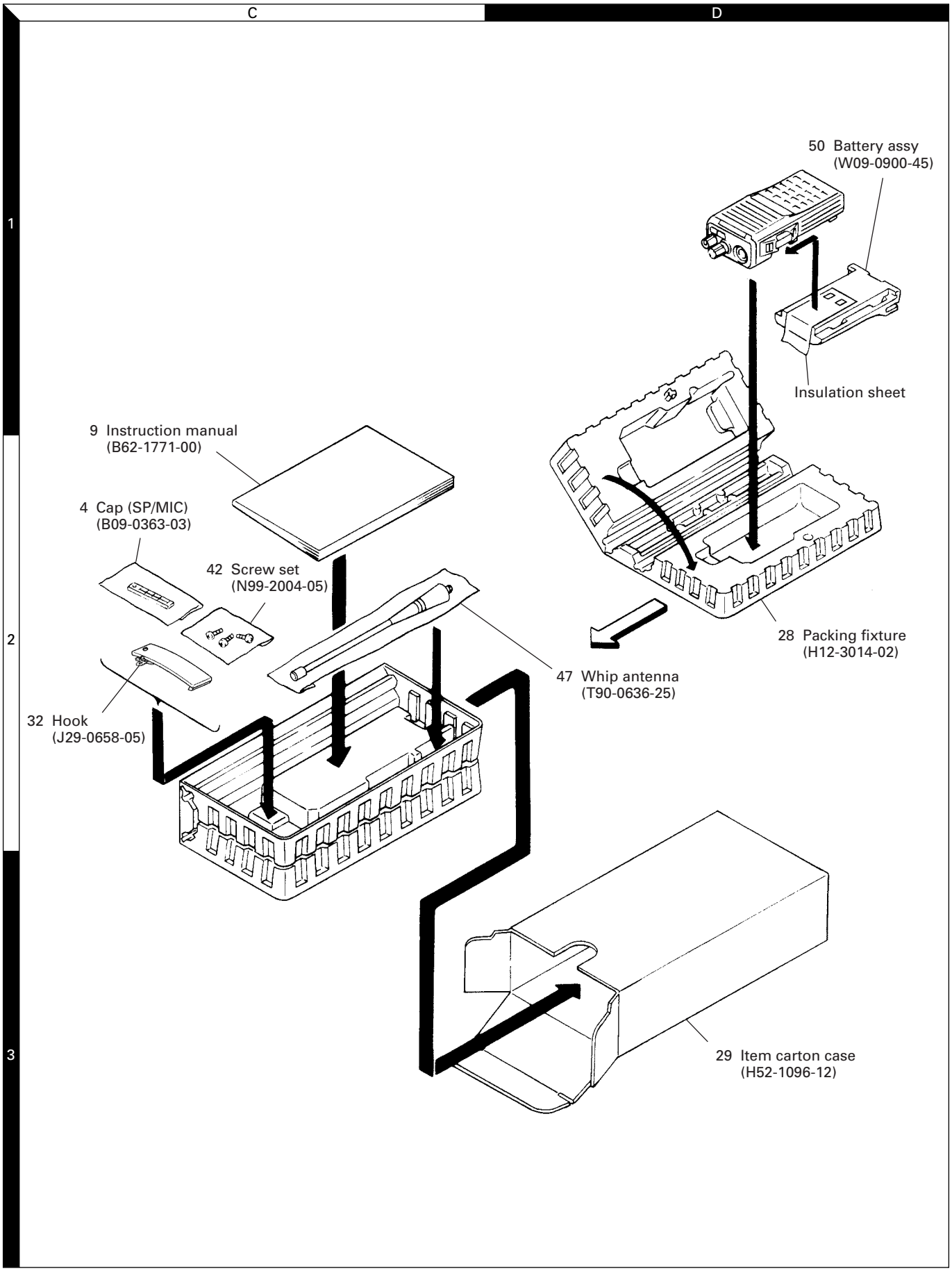
EXPLODED VIEW



A		: N14-0809-04
B	M2.6 x 5	: N30-2605-46
C	M2.6 x 10	: N30-2610-46
D	M2.6 x 6	: N67-2606-46
E	M2 x 5	: N83-2005-46
F	M2 x 2.5	: N79-2025-46

Parts with the exploded numbers larger than 700 are not supplied.

PACKING


C
D
1
2
3
50 Battery assy
(W09-0900-45)
Insulation sheet
9 Instruction manual
(B62-1771-00)
4 Cap (SP/MIC)
(B09-0363-03)
42 Screw set
(N99-2004-05)
28 Packing fixture
(H12-3014-02)
47 Whip antenna
(T90-0636-25)
32 Hook
(J29-0658-05)
29 Item carton case
(H52-1096-12)

ADJUSTMENT

Test Mode

■ Test mode operating features

This transceiver has a test mode. ***To enter test mode, press [A] key and turn power on. Hold [A] key until test channel No. and test signalling No. appears on LCD.*** Test mode can be inhibited by programming. To exit test mode, switch the power on again. The following functions are available in test mode.

- **Controls**

Controls	"FCN" appears	"FCN" not appears
[PTT]	Used when making a transmission.	Used when making a transmission.
[AUX]	Unused	Unused.
[MON]	Monitor ON and OFF.	Monitor ON and OFF.
[LAMP]	Lights the lamp for five seconds. Lighting is extended for a further five seconds by pressing any key while the lamp is lit.	Unused.
[S]	MSK 1200 bps and 2400 bps	Sets to the Tuning mode.
[A]	Function OFF	Function ON.
[B]	Compander function ON and OFF.	RF power HIGH and LOW.
[C]	Beat shift ON and OFF	Changes group.
[0] to [9], and [#], [∗]	Used as the DTMF keypad. If a key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.	Used as the DTMF keypad. If a key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.
[ENCODER]	Changes system.	Changes system.

Note : If a [S], [A], [B], [C] key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.

- **LCD indicator**

"SCN" Unused
"♪" Lights at Compander ON.
"LO" Lights at RF Power Low.
"P" Unused
"MON" Lights at moniter ON.
"SVC" Unused
"▽" Lights at MSK 2400 bps.

- **LED indicator**

Red LED Lights during transmission. Blinks at the low battery voltage warning.
Green LED Lights when there is a carrier.

- **Sub LCD indicator**

"FCN" Appears at Function ON.

■ Frequency and signalling

The set has been adjusted for the frequencies shown in the following table. When required. re-adjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

Frequency (MHz)

SYS No.	RX (TX : TA)	TX
1	851.0500	806.0500
2	851.5500	806.5500
3	860.0000	815.0000
4	860.5000	815.5000
5	865.9875	820.9875
6	869.4000	824.4000
7	869.9000	824.9000
8	855.4000	810.4000
9	865.6000	820.6000
10	867.5000	822.5000
11~16	–	–

Signalling

Group No.	RX	TX
1	None	None
2	None	100Hz square
3	LTR data	LTR data
4	QT 67.0Hz	QT 67.0Hz
5	QT 151.4Hz	QT 151.4Hz
6	QT 210.7Hz	QT 210.7Hz
7	QT 250.3Hz	QT 250.3Hz
8	DQT D023N	DQT D023N
9	DQT D754I	DQT D754I
10	DTMF DEC, (159D)	DTMF DEC, (159D)
11	None	DTMF tone 9
12	None	None
13	Single tone 1200Hz	Single tone 1200Hz
14	None	MSK
15	MSK code	MSK code

- **Preparations for tuning the transceiver**

Before attempting to tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter).

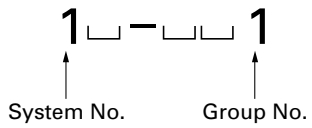
The speaker output connector must be terminated with a 16Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

ADJUSTMENT

- **Transceiver tuning**
  (To place transceiver in tuning mode)

System appears on LCD. Set system according to tuning requirements.

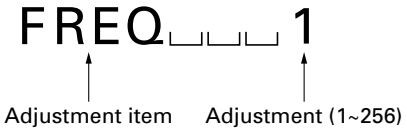
LCD display (Test mode)



Press [S], now in tuning mode. Use [◀B] button to write tuning data through tuning modes, and channel selector knob to adjust tuning requirements (1 to 256 appears on LCD).

Use [C▶] button to select the adjustment item through tuning modes. Use [A] button to adjust 3 point tuning.

LCD display (Tuning mode)

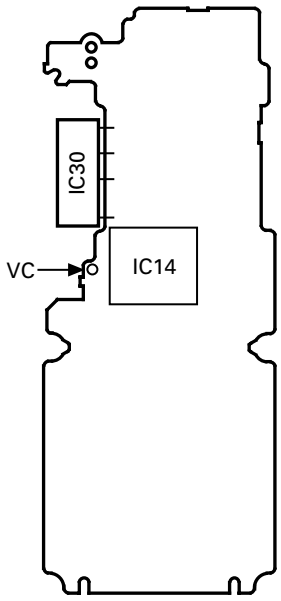


3-point tuning frequency (MHz)

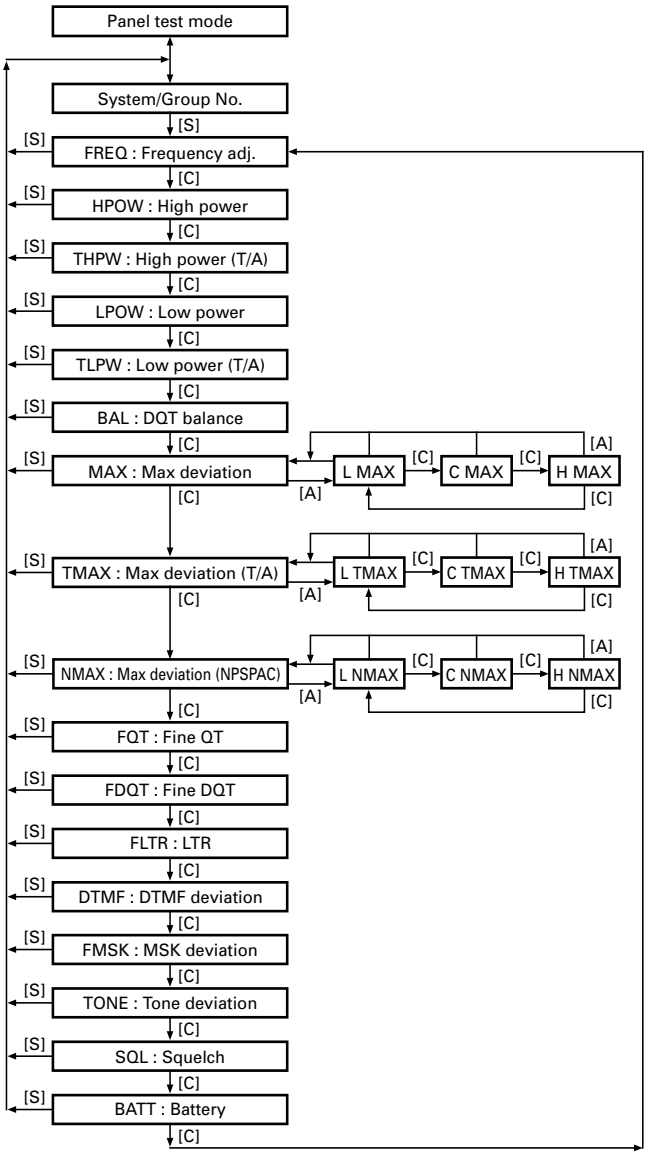
Test CH	RX	TX
Low	851.05000	806.05000
Center	860.50000	815.50000
High	869.90000	824.90000

Adjustment Points

TX-RX unit (X57-5630-10) Component side view



■ Tuning mode



ADJUSTMENT

Common Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal voltage : 7.5V Standard modulation MOD : 1kHz DEV : ±3kHz							
2. VCO lock voltage	1) SYS – GRP : 1 – 1	Power meter DVM	TX-RX	VC			Check	0.5V or more
	2) SYS – GRP : 7 – 1 PTT : ON							4.3V or less
	3) SYS – GRP : 7 – 1 TA mode : ON PTT : ON							

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency adjustment	1) SYS – GRP : 4 – ✻ Select FREQ ✻✻✻ in tuning mode. PTT : ON	f. counter	Panel	ANT	Panel	Encoder knob	815.500MHz	±100Hz
2. Maximum power check	1) SYS – GRP : 4 – ✻ Select HPOW 256 in tuning mode. PTT : ON	Power meter Ammeter	Panel	ANT			Check	3.0W or more
3. TX high power adjustment	1) SYS – GRP : 4 – ✻ Select HPOW ✻✻✻ in tuning mode. PTT : ON				Panel	Encoder knob	2.5W	±0.1W 1.7A or less
4. TX T/A high power adjustment	1) SYS – GRP : 4 – ✻ Select THPW ✻✻✻ in tuning mode. PTT : ON							
5. TX high power check	1) SYS – GRP : 1 – ✻, 7 – ✻ TA mode : OFF and ON (Press [A] key, then [C] key) PTT : ON						Check	2.0~3.0W 1.7A or less
6. TX low power adjustment	1) SYS – GRP : 4 – ✻ Select LPOW ✻✻✻ in tuning mode. PTT : ON				Panel	Encoder knob	1.0W	±0.1W 1.2A or less
7. TX T/A low power adjustment	1) SYS – GRP : 4 – ✻ Select TLPW ✻✻✻ in tuning mode. PTT : ON							
8. TX low power check	1) SYS – GRP : 1 – ✻, 7 – ✻ Low power (Press [B] key) TA mode : OFF and ON (Press [A] key, then [C] key) PTT : ON						Check	0.5~1.5W 1.2A or less

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. DQT BAL adjustment	1) SYS – GRP : 4 – ✻ Select BAL ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 3kHz HPF : OFF PTT : ON	Power meter Deviation meter Oscilloscope AG AF VTVM	Panel	ANT	Panel	Encoder knob	Make the demodulation waves into square waves.	
10. MAX DEV adjustment	1) SYS – GRP : 4 – ✻ Select MAX ✻✻✻ in tuning mode. AG : 1kHz/150mV Deviation meter filter setting LPF : 15kHz HPF : OFF Adjustment item L MAX ✻✻✻→C MAX ✻✻✻ →H MAX ✻✻✻ PTT : ON			Universal			3.8kHz (According to the larger +, –.)	±50Hz
11. T/A MAX DEV adjustment	1) SYS – GRP : 4 – ✻ Select TMAX ✻✻✻ in tuning mode. AG : 1kHz/150mV Deviation meter filter setting LPF : 15kHz HPF : OFF Adjustment item L TMAX ✻✻✻→C TMAX ✻✻✻ →H TMAX ✻✻✻ PTT : ON							
12. NPSPAC MAX DEV adjustment	1) SYS – GRP : 10 – ✻ Select NMAX ✻✻✻ in tuning mode. AG : 1kHz/150mV Deviation meter filter setting LPF : 15kHz HPF : OFF Adjustment item L NMAX ✻✻✻→C NMAX ✻✻✻ →H NMAX ✻✻✻ PTT : ON						2.9kHz (According to the larger +, –.)	±50Hz
13. MIC sensitivity check	1) SYS – GRP : 4 – 1 AG : 1kHz/15mV Deviation meter filter setting LPF : 15kHz HPF : OFF PTT : ON						Check	2.2~3.6kHz
14. T/A MIC sensitivity check	1) SYS – GRP : 4 – 1 TA mode : ON (Press [A] key, then [C] key) AG : 1kHz/15mV Deviation meter filter setting LPF : 15kHz HPF : OFF PTT : ON							

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
15. QT DEV adjustment	1) SYS – GRP : 4 – ✻ MIC input : OFF Select FQT ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 3kHz HPF : 50Hz De-emphasis : 750µs PTT : ON	Power meter Deviation meter Oscilloscope AG AF VTVM	Panel	ANT	Panel	Encoder knob	0.75kHz	±0.05kHz
16. DQT DEV adjustment	1) SYS – GRP : 4 – ✻ Select FDQT ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 3kHz HPF : OFF PTT : ON							
17.LTR DEV adjustment	1) SYS – GRP : 4 – ✻ Select FLTR ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 3kHz HPF : OFF PTT : ON						1.00kHz	±0.10kHz
18. DTMF DEV adjustment	1) SYS – GRP : 4 – ✻ Select DTMF ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 15kHz HPF : OFF PTT : ON						3.00kHz	±0.15kHz
19. MSK DEV adjustment	1) SYS – GRP : 4 – ✻ Select FMSK ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 15kHz HPF : OFF PTT : ON							
20. TONE DEV adjustment	1) SYS – GRP : 4 – ✻ Select TONE ✻✻✻ in tuning mode. Deviation meter filter setting LPF : 15kHz HPF : OFF PTT : ON						2.5kHz	±0.1kHz
21. BATT detection writing	1) SYS – GRP : 4 – ✻ Select BATT ✻✻✻ in tuning mode. PTT : ON						After pressing the PTT switch, confirm that one predetermined numeric in the range 1 to 256 appears and then press [B] key. That numeric will be stored in memory.	BATT terminal voltage : 6.2V

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
22. BATT detection check	1) SYS – GRP : 4 – 1 BATT terminal voltage : 5.7V PTT : ON	Power meter Deviation meter Oscilloscope AG AF VTVM	Panel	ANT	Panel	Encoder knob	Check	Can not transmit. LED (TX) blinks.
	2) BATT terminal voltage : 6.5V PTT : ON							Transmit

Note : When the CPU is changed these adjustment values will become suitable values for NPSPAC, the deviations except MAX DEV in NPSPAC band are automatically adjusted.

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Sensitivity check	1) SYS – GRP : 1 – 1 SSG output : –116dBm MOD : 1kHz DEV : ±3kHz	SSG AF VTVM Oscilloscope Distortion meter	Panel	ANT			Check	12dB SINAD or more.
2. Squelch adjustment	1) SYS – GRP : 4 – ✻ Select SQL ✻✻✻ in tuning mode. SSG output : 3dB below to 12dB SINAD level				Panel	Encoder knob	Adjust to point of closing squelch.	
3. Squelch check See Note.	1) SYS – GRP : 4 – 1 SSG output : 12dB SINAD level						Check	Squelch must be opened.
	2) SSG output : OFF							Squelch must be closed.

Note : When squelch is adjusted, the microcomputer simultaneously reads and writes the RSSI level. Do not write adjustment values without the SSG connected.

TK-480

SPECIFICATIONS

General

Frequency Range	
RX	851 to 870MHz
TX	806 to 825MHz (851 to 870MHz : Talk-Around)
Systems	Maximum 32
Groups	Maximum 250
Conventional Channels	Maximum 600
Channel Spacing	25kHz (PLL channel step 12.5kHz)
Battery Voltage	DC 7.5V
Battery Life	More than 8 hours at 5-5-90 duty cycle with KNB-16A battery
Temperature Range	–30°C to +60°C (–22°F to +140°F)
Dimensions and Weight	
With KNB-16A (1100mAh battery)	135 (5.33) H x 58 (2.29) W x 34 (1.34) D mm (inch) 1.01lbs (460g)
(Dimensions not including protrusions, weight includes antenna and belt hook)	

Receiver (Measurements made per TIA/EIA-603)

RF Input Impedance	50Ω
Sensitivity (12dB SINAD*)	0.30μV
Selectivity*	70dB±25kHz
Intermodulation*	65dB±25/50kHz
Spurious (Except for IF 1/2)*	70dB
Frequency Stability	±0.00025% (–30°C to +60°C)
Channel Spread	19MHz
Audio Power Output	500mW at 16Ω less than 5% distortion

* : Typical specifications

Transmitter (Measurements made per TIA/EIA-603)

RF Power Output	
High	2.5W
Low	1W
RF Output Impedance	50Ω
Spurious	–60dB
Modulation	16K0F3E, 16K0F1D, 15K0F2D, 14K0F3E, 14K0F1D, 13K0F2D
FM Noise	–45dB
Audio Distortion	5.0% or less
Frequency Stability	±0.00025% (–30°C to +60°C)
Channel Spread	64MHz

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