ORDER NO. KM49803489S0
F1

Service Manual

Supplement

Telephone Equipment

KX-TCM422-B/KX-TCM422-W
KX-TCM420-B
(for U.S.A.)

Cordless Phone with Answering System

KX-TCM415MXB/KX-TCM415MXW
KX-TCM418MXB/KX-TCM420MX-B
KX-TCM506BX-B/KX-TCM506BX-W
KX-TCM516BX-B/KX-TCM526BX-B
(for Asia, Middle Near East and Other areas)

KX-TCM416LBB
(for Brasil)

Please use this manual together with the original service manuals mentioned below.

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians.
Any attempt service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

This supplement has been issued for below items:

1. **Change of IF IC to improve of electric static, and change of suffix of portable handset to correspond to it**
2. **Correction of cabinet part's Ref. No.**
3. **Correction of Explanation of IC Terminals**

Model No.	Order No.	Sup. No.	Country
KX-TCM422-B/KX-TCM422-W	KM49706165C1	3	U.S.A.
KX-TCM420-B	KM49707173A1	3	
KX-TCM415MXB/KX-TCM415MXW	KM49710199A3	1	Asia, Middle Near East and Other areas
KX-TCM418MXB	KM49709194A3	1	
KX-TCM420MX-B	KM49708184A3	3	
KX-TCM526BX-B	KM49709186C3	2	
KX-TCM516BX-B	KM49709192A3	2	
KX-TCM506BX-B/KX-TCM506BX-W	KM49709191A3	2	
KX-TCM416LBB	KM49710204A3	1	Brasil

Panasonic

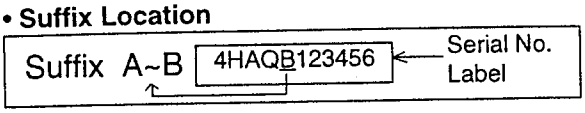
CHANGES

■ CHANGE OF SUFFIX

For all models/Portable Handset only

Suffix	The reason for the suffix change
A → B	To change of IF IC (IC1) for electric static.

• Suffix Location



■ REPLACEMENT PARTS LIST

Reason for Change	The following reasons (1-8) are indicated in the Note below.
1. Improve performance	
2. Change of material or dimension	
3. To meet approved specification	
4. Standardization	
5. Addition	
6. Deletion	
7. Correction	
8. Other	

Interchangeability Code The following interchangeabilities (V-Z) are indicated in the Note below.

	Parts	Set Production	Description
V	Original / New	Early (before change) / Late (after change)	Original or new parts may be used in early or late production sets. Use original parts until exhausted, then stock new parts.
W	Original / New	Early (before change) / Late (after change)	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
X	Original / New	Early (before change) / Late (after change)	New parts may only be used in early or late production sets. Stock new parts.
Y	Original / New	Early (before change) / Late (after change)	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
Z	Other		

For all models:

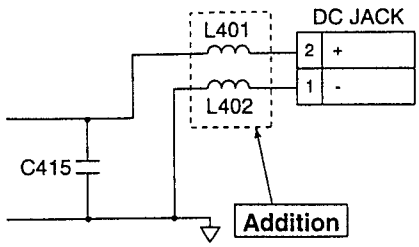
Ref. No.	Part No. Original	Part No. Supplement	Part Name & Description	Pcs/Set	Implementation	Suffix	Notes	
BASE UNIT								
L401	-----	**PQLQX100K**	Coil	1	Dec. '97	B	5	
L401	PQLQZK1R2K	**PQLQX100K**	Coil *2	1	Dec. '97	B	5	
L402	-----	**PQLQX100K**	Coil *1	1	Dec. '97	B	5	
CF401	PQVFCM04RC01	-----	Ceramic Filter *1	0	Dec. '97	B	6	
C858	ECEA1AKS221	**ECEA0JKS101**	Capacitor, 100µF	1	Dec. '97	B	1	W
IC201	PQVITB31224H	**PQVIT31224AH**	IC *3	1	Feb. '98	B	1	W
PORTABLE HANDSET								
IC1	PQVITB31224R	**PQVIT31224AR**	IC *3	1	Feb. '98	A → B	1	W
PACKING MATERIALS								
P1	PQPH75Z	**PQPP170Z**	Protection Cover (for Portable Handset)	1	Dec. '97	---	1	W
P2	PQPH89Y	**XZB10X35A02**	Protection Cover (for Base Unit)	1	Dec. '97	---	1	W
P3	PQPD10350Z	-----	Manual Box	0	Dec. '97	---	6	
P4	PQPN10598Z	**PQPN10618Z**	Cushion	1	Dec. '97	---	1	W
P5	PQPN10599Z	-----	Accessory Box	0	Dec. '97	---	6	
P6	PQPK12333Z	**PQPK12465Z**	Gift Box (Black) for KX-TCM422-B only	1	Dec. '97	---	1	W
P6	PQPK12334Z	**PQPK12476Z**	Gift Box (White) for KX-TCM422-W only	1	Dec. '97	---	1	W

Notes: 1. *1 marking parts are only for the models: **KX-TCM422-B/KX-TCM422-W/KX-TCM420-B/KX-TCM420MX-B.**
2. *2 marking part is only for the models: **KX-TCM526BX-B/KX-TCM516BX-B/KX-TCM506BX-B/KX-TCM506BX-W.**
3. Only *3 marking parts have been changed only for the models: **KX-TCM418MXB/KX-TCM415MXB KX-TCM415MXW/KX-TCM416LBB.**

Reason for Change

Interchangeability Code

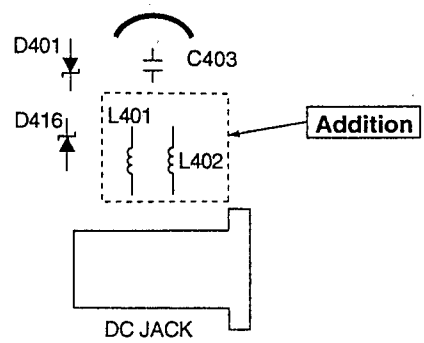
■ SCHEMATIC DIAGRAM (BASE UNIT)



(Supplement)

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (BASE UNIT)

(Component View)

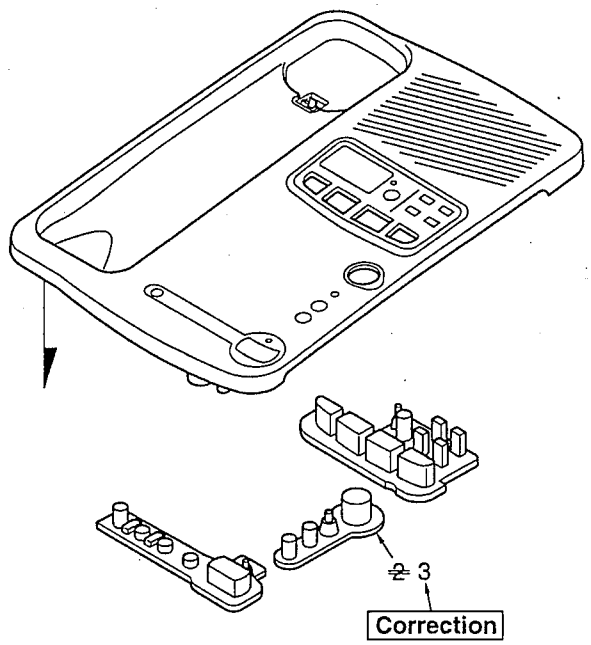


(Supplement)

CORRECTIONS

Model No.: KX-TCM418MXB/KX-TCM415MXB/KX-TCM415MXW/KX-TCM416LBB

■ CABINET AND ELECTRICAL PARTS LOCATION (BASE UNIT)

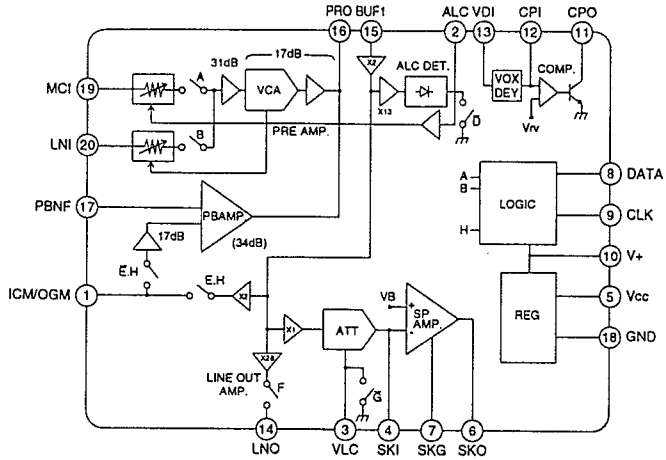


Note: Ref. No. has been corrected as shown above figure.

(Supplement)

■ EXPLANATION OF IC TERMINALS (BASE UNIT)

Pin description table has been corrected as below on pages 4~6.

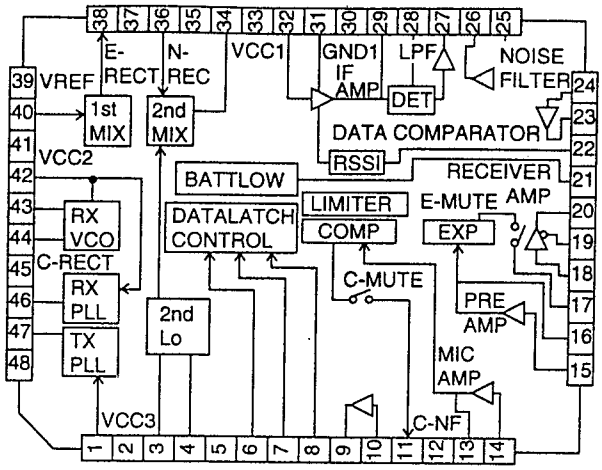


IC805: PQVISC111815

• **Pin Description**

Pin No.	Name	Description
1	ICM/OGM	I/O for ICM head. I/O impedance is approximately 20 kohm that keeps high impedance sufficient for head load.
2	ALC	For connection to CR for ALC detection smoothing. The time constant of the CR decides the recovery time. The attack time depends on the values of C and internal resistance (approx. 8.5 kohm).
3	VLC	Volume control input. The DC voltage gained by dividing V+ the resistor adjusts the speaker output.
4	SKI	Reverse input of the speaker amplifier. The gain and frequency characteristics are set by external CR. Non-reverse input is biased by internal power source (approx. 1/2 Vcc).
5	Vcc	Power source of IC except LOGIC part.
6	SKO	Output of speaker amplifier. Sets frequency characteristics by connecting to Pin 4 in parallel. Speaker's impedance is normally 8 ohms.
7	SKG	GND speaker amplifier output part.
8	DATA	Input of control data for mute mode. For serial synchronous input with clock signal.
9	CLK	Clock input for data input sychronization. Controls shift register by data bit at fall, and latches by reading data at rise.
10	V+	5.4 V stable output to supply bias with microphone.
11	CPO	output of comparator. Connected to open-collector of NPN transistor.
12	CPI	Input of VOX detector comparator. Compares internal reference voltage with gained voltage, and has a bit hysteresis characteristics.
13	VDI	Input of VOX detector.
14	LNO	Output of buffer amplifier for line output. Current amplifier.
15	BUFI	Inputs of Recording amplifier, line output amplifier, speaker amplifier, and ALC detector. These are input after voltage/radio conversion by CR between this pin and pin 16.
16	PRO	Output of MIC/LINE amplifier and playback amplifier.
17	PBNF	Reverse input of playback amplifier for controlling frequency characteristics. The CR network between this pin and Pins 16 and 18 set frequency and gain.
18	GND	GND for all ICs except speaker amplifier.
19	MCI	Input of microphone amplifier. The input resistance is normally 33 kohms.
20	LNI	Input of line amplifier. The same configuration as MCI.

■ EXPLANATION OF IC TERMINALS (PORTABLE HANDSET)



Part No.
IC201: PQVITB31224H (Base Unit)
IC1: PQVITB31224R (Portable Handset)

Pin No.	Name	Description
1	TX-IN	Input terminal of TX-VCO
2	VCC3	Power supply terminal
3	LO-1	Local oscillator input output terminal
4	LO-2	Colpitts oscillating circuit consists of internal emitter follower circuit and external crystal. Additionally external injection through pin 3 is available.
5	SIG OUT	Detection signal output terminal, which is an open drain.
6	CLK	Clock input terminal / Input the serial data to control this IC.
7	DATA	Serial data input terminal
8	STB	Strobe signal input terminal
9	FIL-OUT	Filter amplifier output terminal
10	FIL-IN	Filter amplifier input terminal
11	COMP-OUT	Compressor output
12	C-NF	SUM amplifier T-shape feed-back circuit consists of external compressor.
13	MIC-OUT	Mic amplifier output, which is connected to SUM amplifier input directly.
14	MIC-IN	Mic amplifier input terminal
15	PRE-IN	Preamplifier inverting input terminal
16	PRE-OUT	Preamplifier output terminal, which is connected to expander directly.
17	EXP-OUT	Expander SUM amplifier output terminal, where the signal from gain cell is amplified as inverting amplifier.
18	RECE-IN	Receiver amplifier inverting input terminal
19	RO1	Receiving output terminal for dynamic receiver
20	RO2	Outputs from RO1 and RO2 (BTL type) when ceramic receiver is using.
21	BAT-ALM	Battery alarm terminal goes high when power supply voltage VCC becomes VBAT-L or less. Data bit controls the detection voltage. This terminal is an open collector output.
22	RSSI	DC voltage is output according to the input signal level of IF amplifier. The dynamic range is approximately 70dB.
23	DATA-OUT	Wave arrangement output terminal. This terminal is an open collector output.
24	D-COMP-IN	Data comparator input terminal to which demodulated signal of data is input.

Pin No.	Name	Description
25	N FIL-IN	Noise filter input output terminal. BPF consists of external condenser and resistor. This terminal is connected to the rectifier circuit through inside coupling condenser.
26	N FIL-OUT	
27	AF-OUT	Demodulation output signal terminal. Carrier leak is decreased by built-in LPF. Output impedance is approximately 360Ω.
28	QUAD	Phase input terminal of FM demodulator
29	IF-OUT	IF output terminal
30	GND1	GND terminal
31	DEC	2nd IF input terminal and decoupling terminal for bias. Input impedance of Pin 32 is approximately 1.5kΩ.
32	IF-IN	
33	Vcc1	Power supply terminal
34	2nd MIX-OUT	Mixer output terminal. Output impedance is approximately 1.5kΩ.
35	N-REC	The noise filter output is filtered through external capacitor after amplified about 20dB
36	2nd MIX-IN	1st IF input terminal. Input impedance is approximately 4.7kΩ (at 10.695MHz).
37	E-RECT	Connects to the capacitor for rectification in full-wave rectifier circuit of expander.
38	1st MIX-OUT	Mixer output terminal which is connected to the external filter. Output impedance is approximately 330Ω (standard).
39	V REF	Reference voltage of compander which is passed through inside buffer.
40	1st MIX-IN	Mixer input terminal. The mixer is applied the double balanced mixer method.
41	VCC2	Regulator terminal, which outputs 2.0V.
42	VCO-CONT	RX-VCO voltage control terminal
43	VCO-1	RX-VCO resonant terminal
44	VCO-2	
45	C-RECT	Rectifier terminal of compressor. The circuit configuration is the same with E-RECT terminal.
46	RX-OUT	Charge pump output terminal. Constant current output type is adopted and output current can be changed according to the input data.
47	TX-OUT	
48	GND2	GND terminal

IM (F)
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