

VGS-1

SERVICE MANUAL

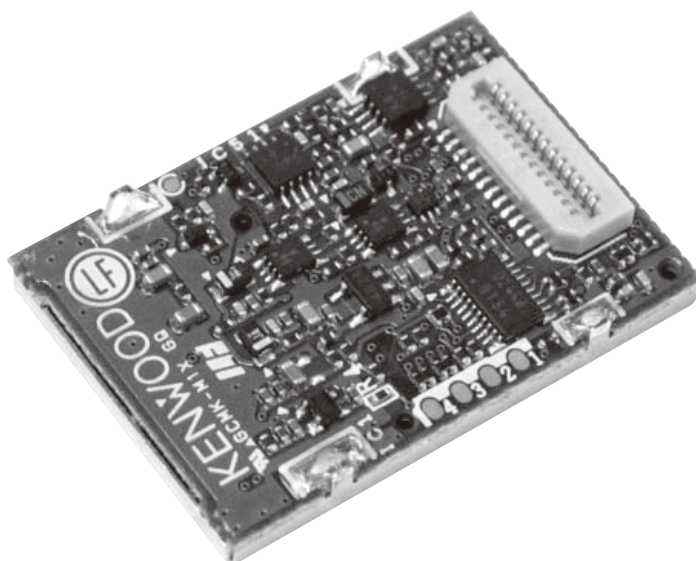
SUPPLEMENT

KENWOOD

Kenwood Corporation

© 2009-5 PRINTED IN JAPAN
B51-8873-00 (N) PDF

This service manual has been revised due to the modification of the PC board and issues it as a supplemental manual. Refer to the VGS-1 service manual (B51-8669-00) for any information which has not been covered in this VGS-1 service manual.



CONTENTS

DISASSEMBLY FOR REPAIR	2
CIRCUIT DESCRIPTION	2
COMPONENTS DESCRIPTION.....	3
PARTS LIST	3
PC BOARD	
ACCESSORY UNIT (X42-3250-60).....	5
SCHEMATIC DIAGRAM	6
TERMINAL FUNCTION	BACK COVER



VGS-1

Document Copyrights

Copyright 2009 by Kenwood Corporation. All rights reserved.

No part of this manual may be reproduced, translated, distributed, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, for any purpose without the prior written permission of Kenwood.

Disclaimer

While every precaution has been taken in the preparation of this manual, Kenwood assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Kenwood reserves the right to make changes to any products herein at any time for improvement purposes.

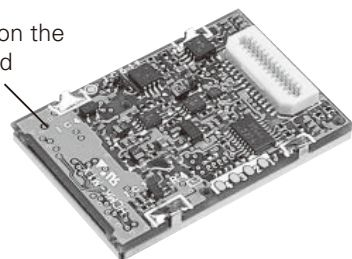
DISASSEMBLY FOR REPAIR

How to Distinguish Between the Old and New VGS-1

You can distinguish between the old and new VGS-1 as described below.

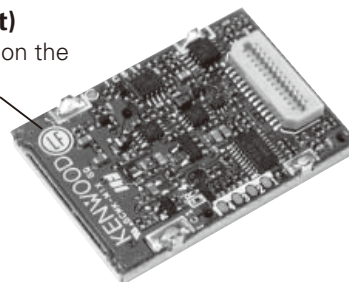
■ VGS-1 (Old product)

The silk of the LF mark on the old product is not printed on the PC board.



■ VGS-1 (New product)

The silk of the LF mark on the new product is printed on the PC board.



Precautions When Repairing the VGS-1

- When you repair VGS-1 used by Amateur transceivers, install it in the Amateur transceiver if it is necessary to install the VGS-1 in the transceiver.
- When you repair VGS-1 used by Land mobile transceivers, install it in the Land mobile transceiver if it is necessary to install the VGS-1 in the transceiver.

CIRCUIT DESCRIPTION

Beat Shift Circuit

To prevent VGS-1 clock oscillation for the MCU (IC2) from causing spurious reception to transceivers to which VGS-1 is connected, the clock oscillator (11.0592MHz) has a beat shift circuit with a transistor switch (Q1).

■ Beat Shift Circuit Off by MCU

When pin 94 of the MCU (IC2) goes Low level, Q2 turns off and Q1 turns on because a 5V bias is applied to its base. In this condition, C10 is shorted, so the oscillation frequency is unchanged.

■ Beat Shift Circuit On by MCU

When pin 94 of the MCU goes High level, Q2 turns on and Q1 turns off because its base is pulled down to GND. In this condition, C10 is connected in series to the crystal oscillator and the oscillation frequency increases by approx. 150ppm.

■ Beat Shift Circuit On/Off with External Device

When pin 94 of the MCU is in the Low level state, the beat shift circuit turns on by designating pin 17 of the con-

nected CN1 connector of the external device as High level, and the oscillation frequency increases by approx. 150ppm. (Q2 becomes the OR circuit.)

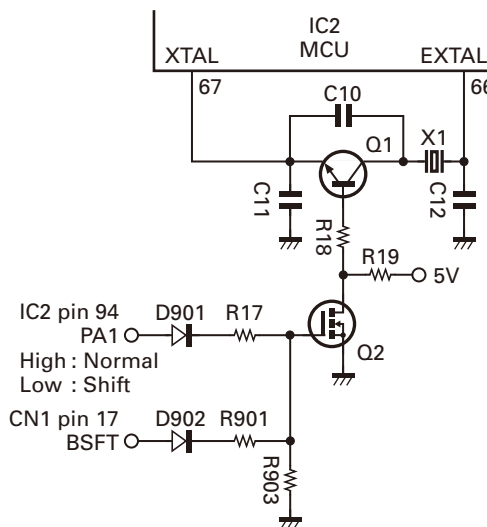


Fig. 1 Beat shift circuit

COMPONENTS DESCRIPTION

Accessory Unit (X42-3250-60)

Ref.No.	Use / Fncion	Opration / Condition
Q1	SW : 3V→5V Level Shifting	When the beat shift is operating : ON
Q2	Beat Shift Switch	When the beat shift is operating : OFF
Q51	Audio Mute Switch	When a playback output is completed : ON
IC1	Reset	For MCU (IC2) and Flash memory (IC5)
IC2	MCU	
IC3	SRAM	Buffer, Firmware record
IC5	Flash memory	Data record
IC51	Low Pass Filter	LPF for a playback output
IC52	Buffer + Filter AMP	For recording input signals
IC53	Analog Switch	Attenuator Control
IC54	Analog Switch	Attenuator Control
IC55	Buffer	Buffer for a playback output
IC56	3V Regulator	3V Power Supply
IC57	Bus Switch with Level Shifting	3V↔5V Level Shifting & 3V↔3V Bus Switch

PARTS LIST

* New Parts. Δ 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

VGS-1 (Y60-4010-60) ACCESSORY UNIT (X42-3250-60)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
VGS-1					
		*	B62-1741-30	INSTRUCTION MANUAL	
			F10-2492-04	SHIELDING COVER	
		*	G02-1846-03	FLAT SPRING	
		*	G02-1853-03	FLAT SPRING	
			G13-1974-04	CUSHION (21X21X1.0)	
			G13-1992-04	CUSHION (21X21X2.5)	
			G13-1993-04	CUSHION (21X21X2.0)	
			G13-1994-04	CUSHION (20X30X12)	
			G13-1995-04	CUSHION (20X30X1.0)	
		*	J30-1292-04	SPACER	
ACCESSORY UNIT (X42-3250-60)					
C1			CK73GB1A105K	CHIP C 1.0UF	K
C2			CC73HCH1H101J	CHIP C 100PF	J
C3			CK73HB1H471K	CHIP C 470PF	K
C4			CK73HB1A104K	CHIP C 0.10UF	K
C5			CK73HB1E103K	CHIP C 0.010UF	K
C6			CK73HB1A333K	CHIP C 0.033UF	K
C7			CC73HCH1H101J	CHIP C 100PF	J
C8			CK73GB1A105K	CHIP C 1.0UF	K
C9			CK73HB1H102K	CHIP C 1000PF	K
C10			CC73HCH1H030B	CHIP C 3.0PF	B
C11,12			CC73HCH1H150J	CHIP C 15PF	J
C13			CK73HB1A104K	CHIP C 0.10UF	K

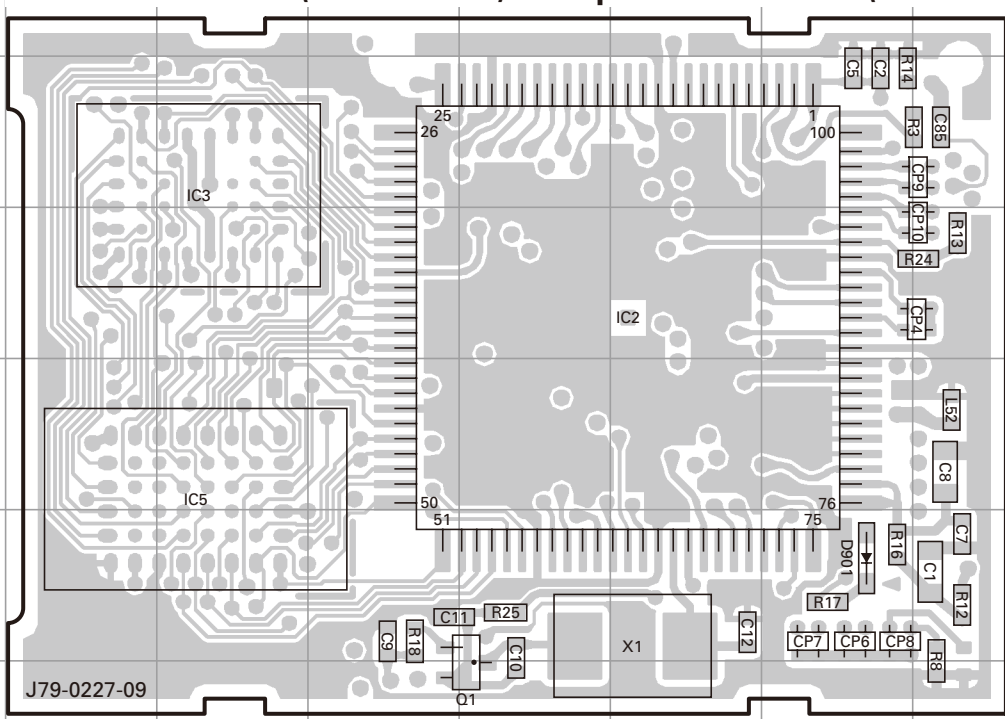
PARTS LIST

ACCESSORY UNIT (X42-3250-60)

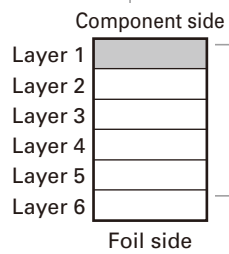
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C14			CK73HB1H471K	CHIP C 470PF K		R14			RK73HB1J224J	CHIP R 220K J 1/16W	
C15			CK73HB1A104K	CHIP C 0.10UF K		R16			RK73HB1J100J	CHIP R 10 J 1/16W	
C16			CK73HB1H471K	CHIP C 470PF K		R17			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C51			CK73GB1A105K	CHIP C 1.0UF K		R18			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C52			CK73HB1C822K	CHIP C 8200PF K		R19			RK73HB1J103J	CHIP R 10K J 1/16W	
C53			CK73HB1H102K	CHIP C 1000PF K		R23			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C54			CK73HB1C822K	CHIP C 8200PF K		R24			RK73HB1J102J	CHIP R 1.0K J 1/16W	
C55			CK73HB1A104K	CHIP C 0.10UF K		R25			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C56			CK73HB1H102K	CHIP C 1000PF K		R27,28			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C57			CK73HB1H681K	CHIP C 680PF K		R51-53			RK73HB1J223J	CHIP R 22K J 1/16W	
C58			CK73HB1E103K	CHIP C 0.010UF K		R54			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C59			CC73HCH1H101J	CHIP C 100PF J		R55			RK73HB1J473J	CHIP R 47K J 1/16W	
C60			CK73HB1E103K	CHIP C 0.010UF K		R56-58			RK73HB1J223J	CHIP R 22K J 1/16W	
C61			CC73HCH1H101J	CHIP C 100PF J		R59			RK73HB1J393J	CHIP R 39K J 1/16W	
C62			CK73HB1A104K	CHIP C 0.10UF K		R60			RK73HB1J473J	CHIP R 47K J 1/16W	
C63			C92-0888-05	CHIP TNTL 10UF 6.3WV		R61			RK73HB1J122J	CHIP R 1.2K J 1/16W	
C64			CC73HCH1H101J	CHIP C 100PF J		R62			RK73HB1J152J	CHIP R 1.5K J 1/16W	
C65			CK73HB1E103K	CHIP C 0.010UF K		R63			RK73HB1J473J	CHIP R 47K J 1/16W	
C66			CC73HCH1H101J	CHIP C 100PF J		R64			RK73HB1J103J	CHIP R 10K J 1/16W	
C67			CK73HB1A104K	CHIP C 0.10UF K		R66			RK73HB1J562J	CHIP R 5.6K J 1/16W	
C68			CK73HB1E103K	CHIP C 0.010UF K		R67			RK73HB1J182J	CHIP R 1.8K J 1/16W	
C69			C92-0888-05	CHIP TNTL 10UF 6.3WV		R69			RK73HB1J473J	CHIP R 47K J 1/16W	
C70			CK73HB1H471K	CHIP C 470PF K		R71			RK73HB1J223J	CHIP R 22K J 1/16W	
C71			CK73GB1A105K	CHIP C 1.0UF K		R72			RK73HB1J123J	CHIP R 12K J 1/16W	
C72			CK73HB1H471K	CHIP C 470PF K		R74,75			RK73HB1J103J	CHIP R 10K J 1/16W	
C73			CK73HB1A104K	CHIP C 0.10UF K		R76			RK73HB1J101J	CHIP R 100 J 1/16W	
C74			CK73GB0J475K	CHIP C 4.7UF K		R78			RK73HB1J101J	CHIP R 100 J 1/16W	
C75			CC73HCH1H101J	CHIP C 100PF J		R79			RK73HB1J100J	CHIP R 10 J 1/16W	
C76,77			CK73HB1H102K	CHIP C 1000PF K		R87			RK73HB1J474J	CHIP R 470K J 1/16W	
C78			CC73HCH1H101J	CHIP C 100PF J		R88			RK73HB1J105J	CHIP R 1.0M J 1/16W	
C79			CK73GB0J475K	CHIP C 4.7UF K		R89			RK73HB1J103J	CHIP R 10K J 1/16W	
C80			CC73HCH1H101J	CHIP C 100PF J		R91			RK73HB1J224J	CHIP R 220K J 1/16W	
C82,83			CC73HCH1H101J	CHIP C 100PF J		R92			RK73HB1J000J	CHIP R 0.0 J 1/16W	
C84,85			CK73HB1H102K	CHIP C 1000PF K		R901			RK73HB1J472J	CHIP R 4.7K J 1/16W	
C86			C92-0634-05	CHIP TNTL 0.33UF 16WV		R902,903			RK73HB1J224J	CHIP R 220K J 1/16W	
C87			CK73HB1A104K	CHIP C 0.10UF K		D901,902			1SS400	DIODE	
C88			CK73HB1E103K	CHIP C 0.010UF K		IC1			S-80930CNNB-G	MOS-IC	
C89			CK73HB1H102K	CHIP C 1000PF K		IC2	*		D33024D10XWV	MICROCONTROLLER IC	
C90			CK73HB1H472K	CHIP C 4700PF K		IC3			Note 1	SRAM IC	
C92-94			CK73GB0J475K	CHIP C 4.7UF K		IC5			Note 1	ROM IC	
CN1			E40-6358-05	SOCKET FOR PIN ASSY		IC51,52			TC75W51FUF	MOS-IC	
L51-53			L92-0163-05	BEADS CORE		IC53,54			TC7W66FK-F	MOS-IC	
L54			L92-0419-15	CHIP FERRITE		IC55			TC75S51FE(F)	MOS-IC	
X1			L77-1950-05	CRYSTAL RESONATOR (11.0592MHZ)		IC56			XC6204B332M	MOS-IC	
CP3		*	RK74HA1J103J	CHIP-COM 10K J 1/16W		IC57			TC7MBD3244AFK	MOS-IC	
CP4		*	RK74HA1J473J	CHIP-COM 47K J 1/16W		Q1	*		DTC114YEB	DIGITAL TRANSISTOR	
CP6-10		*	RK74HA1J473J	CHIP-COM 47K J 1/16W		Q2			2SK1824-A	FET	
CP51,52		*	RK74HA1J472J	CHIP-COM 4.7K J 1/16W		Q51			2SK1824-A	FET	
CP54-57		*	RK74HA1J561J	CHIP-COM 560 J 1/16W		-	*		X42-3250-61	SERVICE ACCESSORY UNIT	
R1			RK73HB1J224J	CHIP R 220K J 1/16W							
R2			RK73HB1J103J	CHIP R 10K J 1/16W							
R3			RK73HB1J472J	CHIP R 4.7K J 1/16W							
R4			RK73HB1J000J	CHIP R 0.0 J 1/16W							
R5			RK73HB1J224J	CHIP R 220K J 1/16W							
R6			RK73HB1J104J	CHIP R 100K J 1/16W							
R8			RK73HB1J000J	CHIP R 0.0 J 1/16W							
R12			RK73HB1J104J	CHIP R 100K J 1/16W							
R13			RK73HB1J473J	CHIP R 47K J 1/16W							

PC BOARD VGS-1

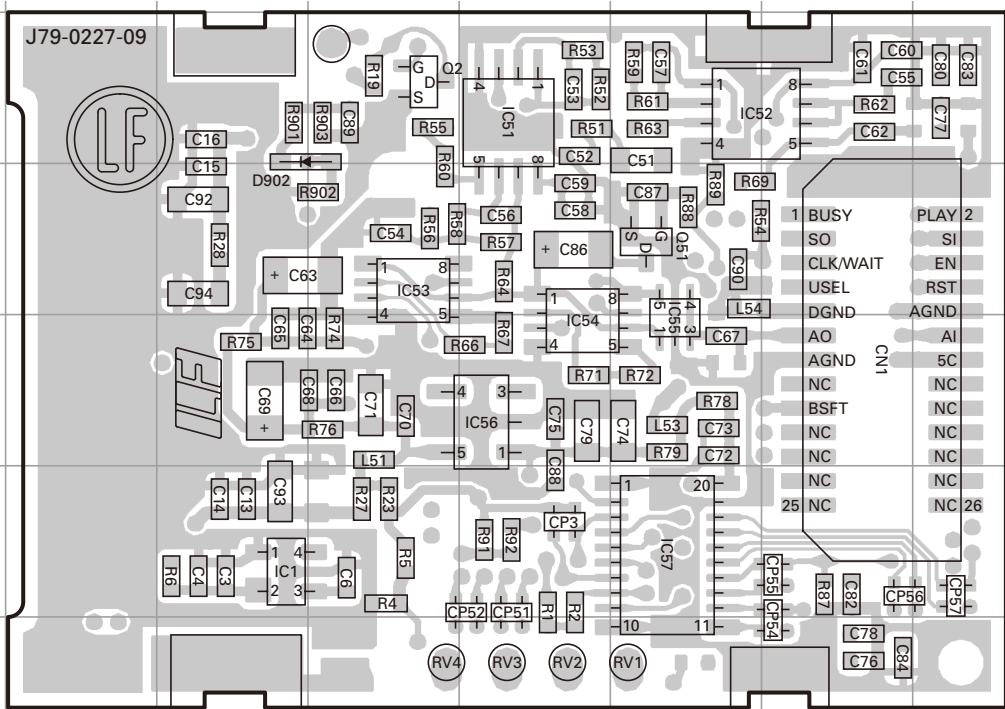
ACCESSORY UNIT (X42-3250-60) Component side view (J79-0227-09)



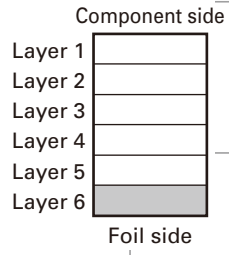
Ref. No.	Address
IC2	4F
IC3	3C
IC5	5C
Q1	7E
D901	6G



ACCESSORY UNIT (X42-3250-60) Foil side view (J79-0227-09)

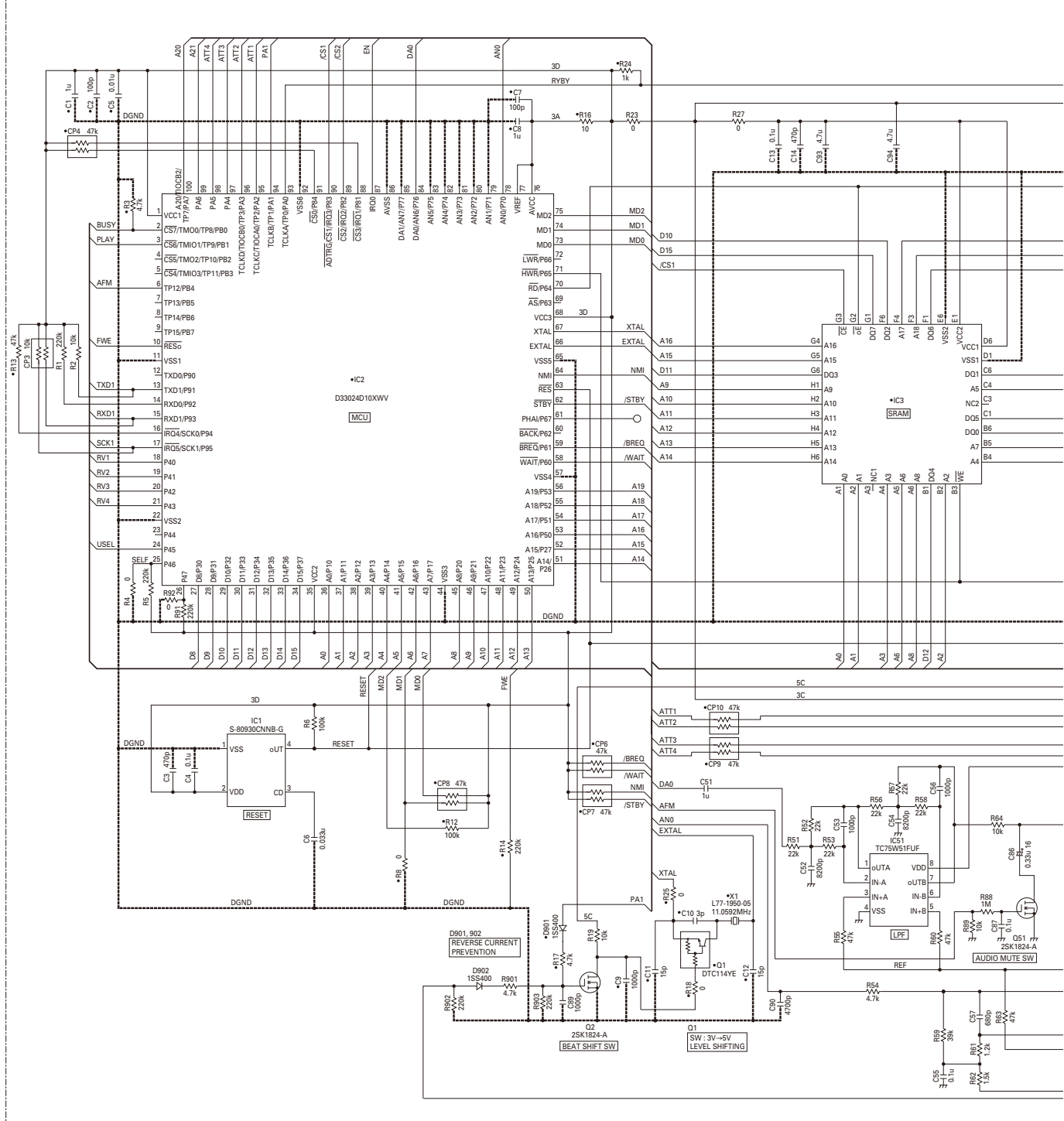


Ref. No.	Address
IC1	12C
IC51	9E
IC52	9F
IC53	10D
IC54	11E
IC55	11F
IC56	11E
IC57	12F
Q2	9D
Q51	10F
D902	10C



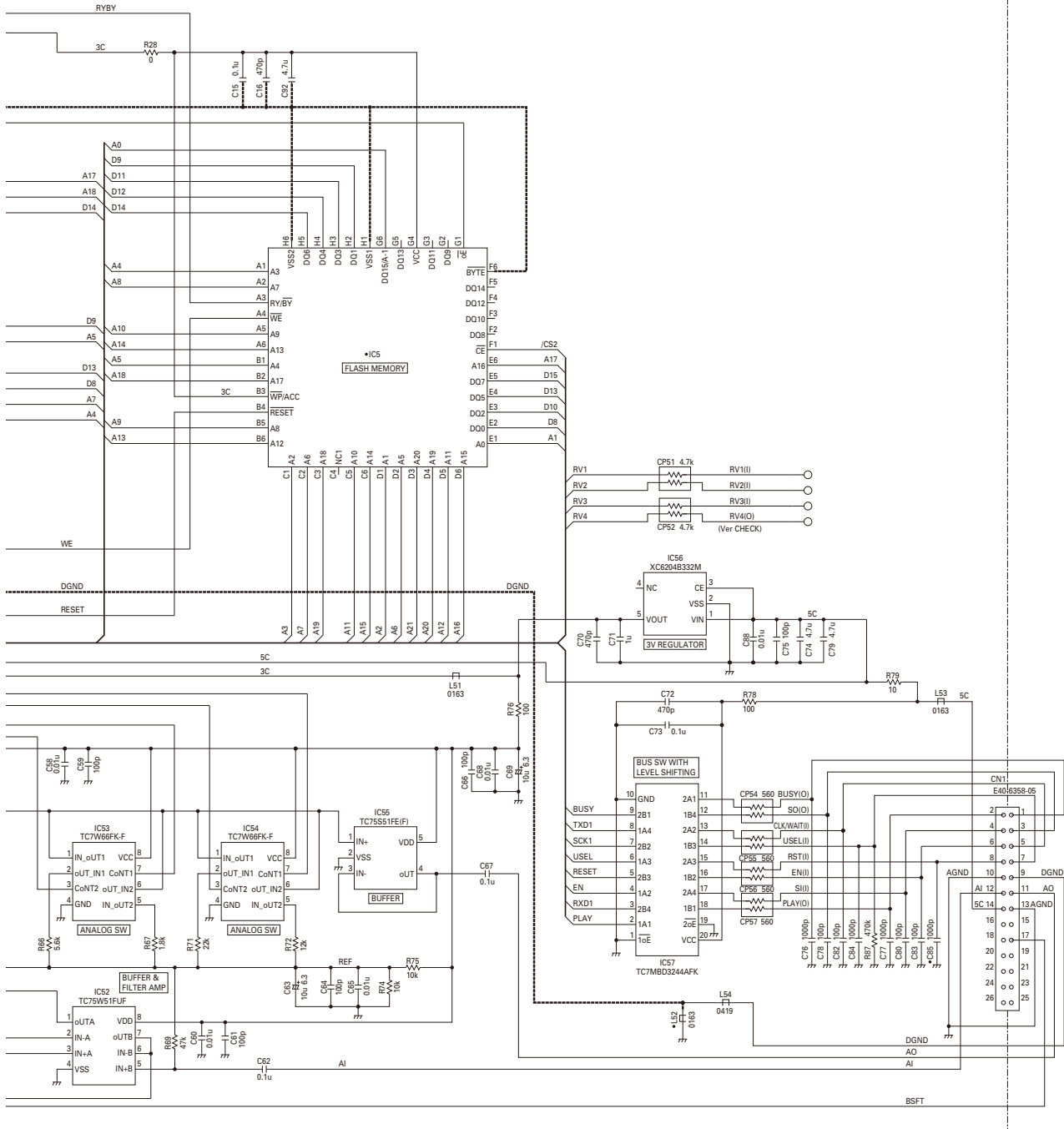
VGS-1 SCHEMATIC DIAGRAM

ACCESSORY UNIT (X42-3250-60) : VGS-1



SCHEMATIC DIAGRAM VGS-1

ACCESSORY UNIT (X42-3250-60) : VGS-1



Note : The components marked with a dot (•) are parts of layer 1.

TERMINAL FUNCTION

Accessory Unit CN1

Pin No.	Name	I/O	Function	Remarks
1	BUSY	O	Busy signal output	Hi : During the Flash memory writing data/During communication command processing
2	PLAY	O	Playback signal output	Hi : During Playback Output
3	SO	O	Serial data output	Control command data input
4	SI	I	Serial data input	Control command data output (Only during UART control)
5	CLK/ WAIT	I	Serial clock input/ Main loop wait time setting	Only during clock synchronous control/ Only during UART control
6	EN	I	Enable input	Lo : Enable/Power save release/Recording or Playback stop
7	USEL	I	Bit rate select signal input for UART	Hi : 115200bps, Lo : 19200bps
8	RST	I	Reset signal input	Lo : Reset
9	DGND	-	Digital GND	
10	AGND	-	Analog GND	
11	AO	O	Prerecorded Voice & Playback output	
12	AI	I	Recording voice input	
13	AGND	-	Analog GND	
14	5C	I	5V Regulator	
15~16	NC	-	No connection	
17	BSFT	I	Beat shift switch	Hi : Beat shift circuit on (OR circuit with control by the MCU)
18~26	NC	-	No connection	

Kenwood Corporation

2967-3, Ishikawa-machi, Hachioji-shi, Tokyo, 192-8525 Japan

Kenwood U.S.A. Corporation

P.O. BOX 22745, 2201 East Dominguez Street, Long Beach, CA 90801-5745, U.S.A.

Kenwood Electronics Canada Inc.

6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

Kenwood Electronics Deutschland GmbH

Rembrücker Str. 15, 63150 Heusenstamm, Germany

Kenwood Electronics Belgium N.V.

Leuvensesteenweg 248 J, 1800 Vilvoorde, Belgium

Kenwood Electronics France S.A.

L'Etoile Paris Nord 2, 50 Allée des Impressionnistes, Bp 58416 Villepinte, 95944 Roissy Ch De Gaulle Cedex

Kenwood Electronics UK Limited

KENWOOD House, Dwight Road, Watford, Herts., WD18 9EB United Kingdom

Kenwood Electronics Europe B.V.

Amsterdamseweg 37, 1422 AC Uithoorn, The Netherlands

Kenwood Electronics Italia S.p.A.

Via G. Sirtori, 7/9 20129 Milano, Italy

Kenwood Ibérica, S.A.

Bolivia, 239-08020 Barcelona, Spain

Kenwood Electronics Australia Pty. Ltd.

(A.C.N. 001 499 074)

16 Giffnock Avenue, Centrecourt Estate, North Ryde, N.S.W. 2113 Australia

Kenwood Electronics (Hong Kong) Ltd.

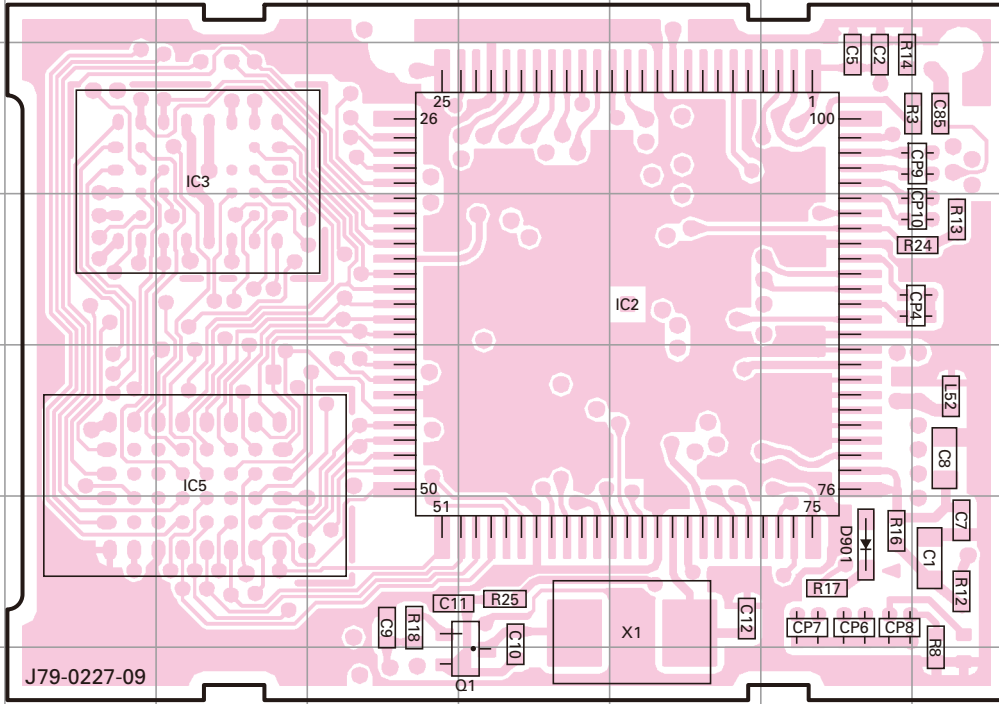
Unit 3712-3724, Level 37, Tower one Metroplaza, 223 Hing Fong Road, Kwai Fong, N.T., Hong Kong

Kenwood Electronics Singapore Pte Ltd

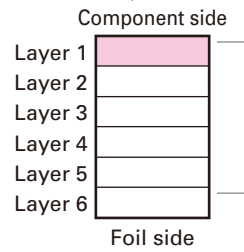
1 Ang Mo Kio Street 63, Singapore 569110

PC BOARD VGS-1

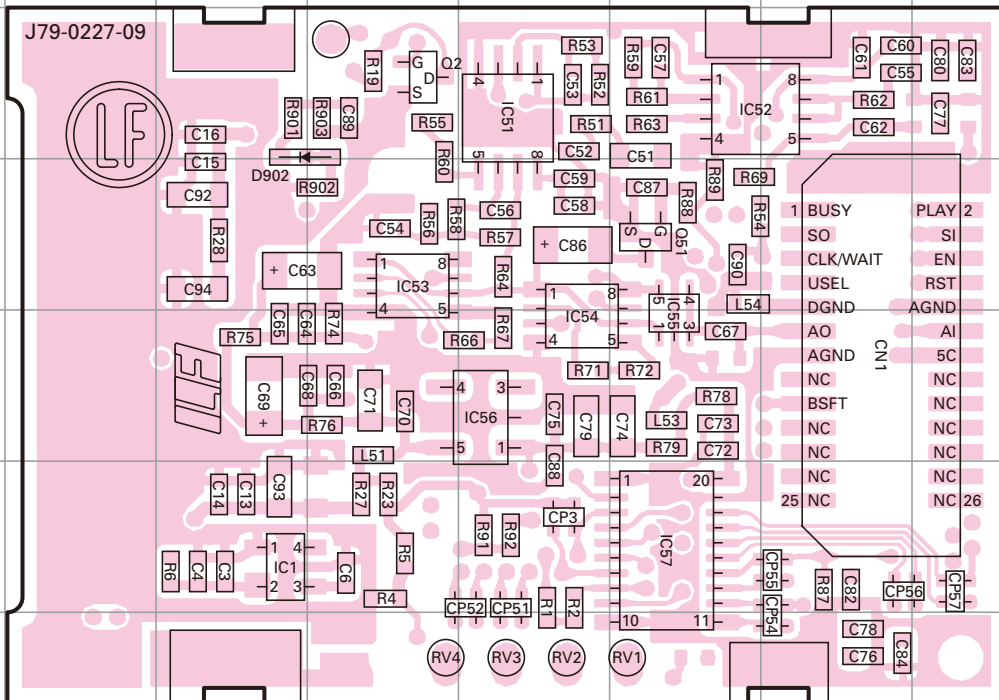
ACCESSORY UNIT (X42-3250-60) Component side view (J79-0227-09)



Ref. No.	Address
IC2	4F
IC3	3C
IC5	5C
Q1	7E
D901	6G



ACCESSORY UNIT (X42-3250-60) Foil side view (J79-0227-09)



Ref. No.	Address
IC1	12C
IC51	9E
IC52	9F
IC53	10D
IC54	11E
IC55	11F
IC56	11E
IC57	12F
Q2	9D
Q51	10F
D902	10C

