Service Manual

PIONEER®

ORDER NO.
CRT-436-0

CENTRATE CAR COMPONENT FM/MW/LW TUNER

FX-T8SDK WG
FX-T8 EW

SPECIFICATIONS

General
Power source ..... DC 14.4V (10.8~15.6V allowable)
Grounding system ..... Negative type
Dimensions ..... 180(W)×25(H)×150(D)mm
Output level rating 100mV
Weight 0.6kg

FM tuner
Frequency range ..... 87.5~108MHz
Usable sensitivity ..... 13.2 dBf (1.8μV/150Ω, mono) (FX-T8SDK/WG)
Usable sensitivity ..... 12 dBf (1.1μV/75Ω, mono) (FX-T8/EW)
50 dB quieting sensitivity .... 18.2 dBf (3μV/150Ω, mono) (FX-T8SDK/WG)
50 dB quieting sensitivity ..... 17 dBf (1.9μV/75Ω, mono) (FX-T8/EW)
Signal-to-noise ratio ..... 70 dB (IEC-A network)
Distortion ..... 0.3% (at 65 dBf, 1kHz, stereo)
Frequency response ..... 30~15,000Hz (±3 dB)
Stereo separation ..... 40 dB (at 65 dBf, 1kHz)

MW tuner
Frequency range ..... 531~1,602kHz
Usable sensitivity ..... 19μV (25 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±9kHz)

LW tuner
Frequency range ..... 153~281kHz
Usable sensitivity ..... 30μV (30 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±9kHz)

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

CONTENTS

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1. CONNECTING THE UNITS

- Before making final connections, make temporary connections then operate the unit to check for any connecting cord problems.
- Refer to the instruction manual for details on connecting the various cords of the deck and main amp then make connections correctly.
- If distance between the tuner and deck is too far to make proper connections, please buy the optional exclusive extension cord for the Component Car Stereo.

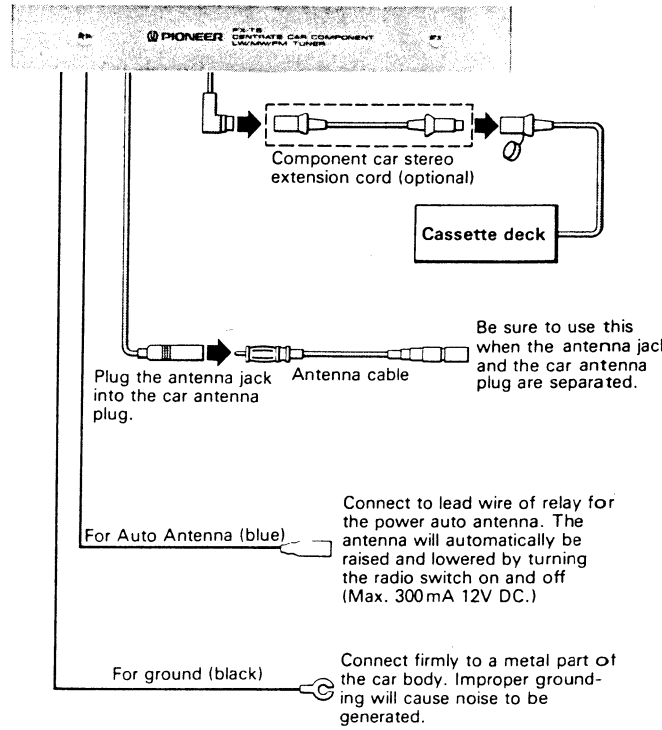


Fig. 1

2. PARTS LOCATION

The photo shows the model FX-T8SDK/WG.

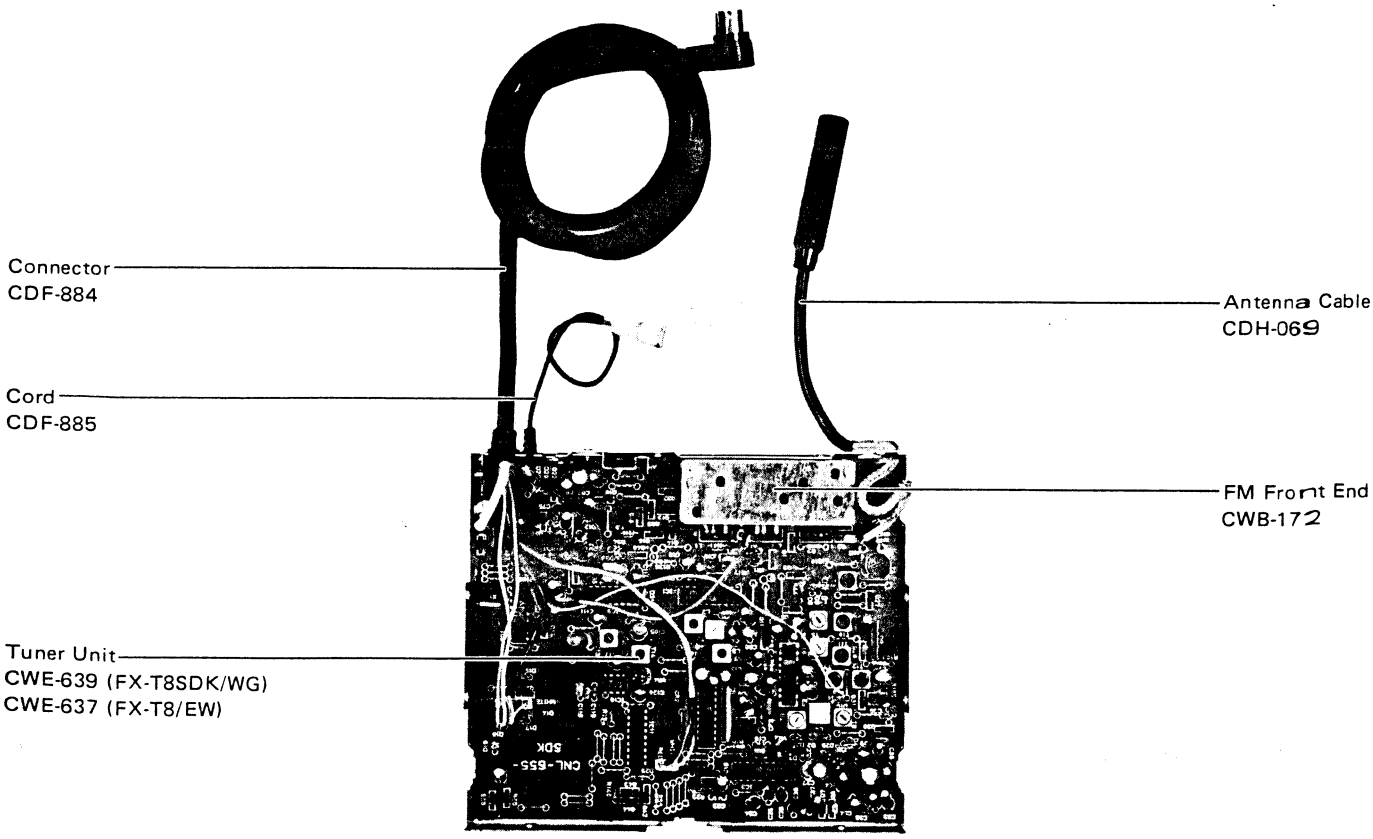


Fig. 2

QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by :

Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

(FX-T8/EW)

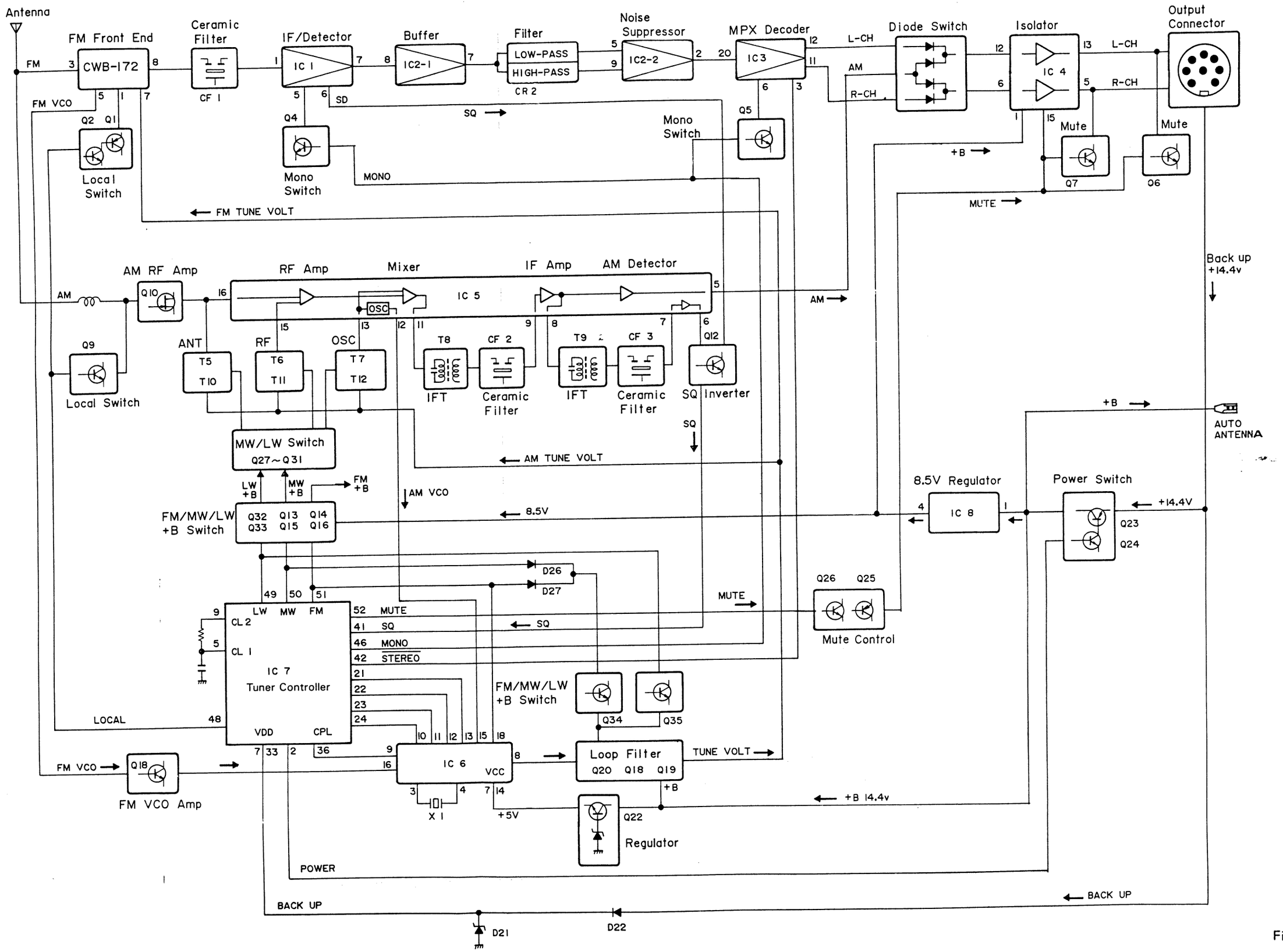
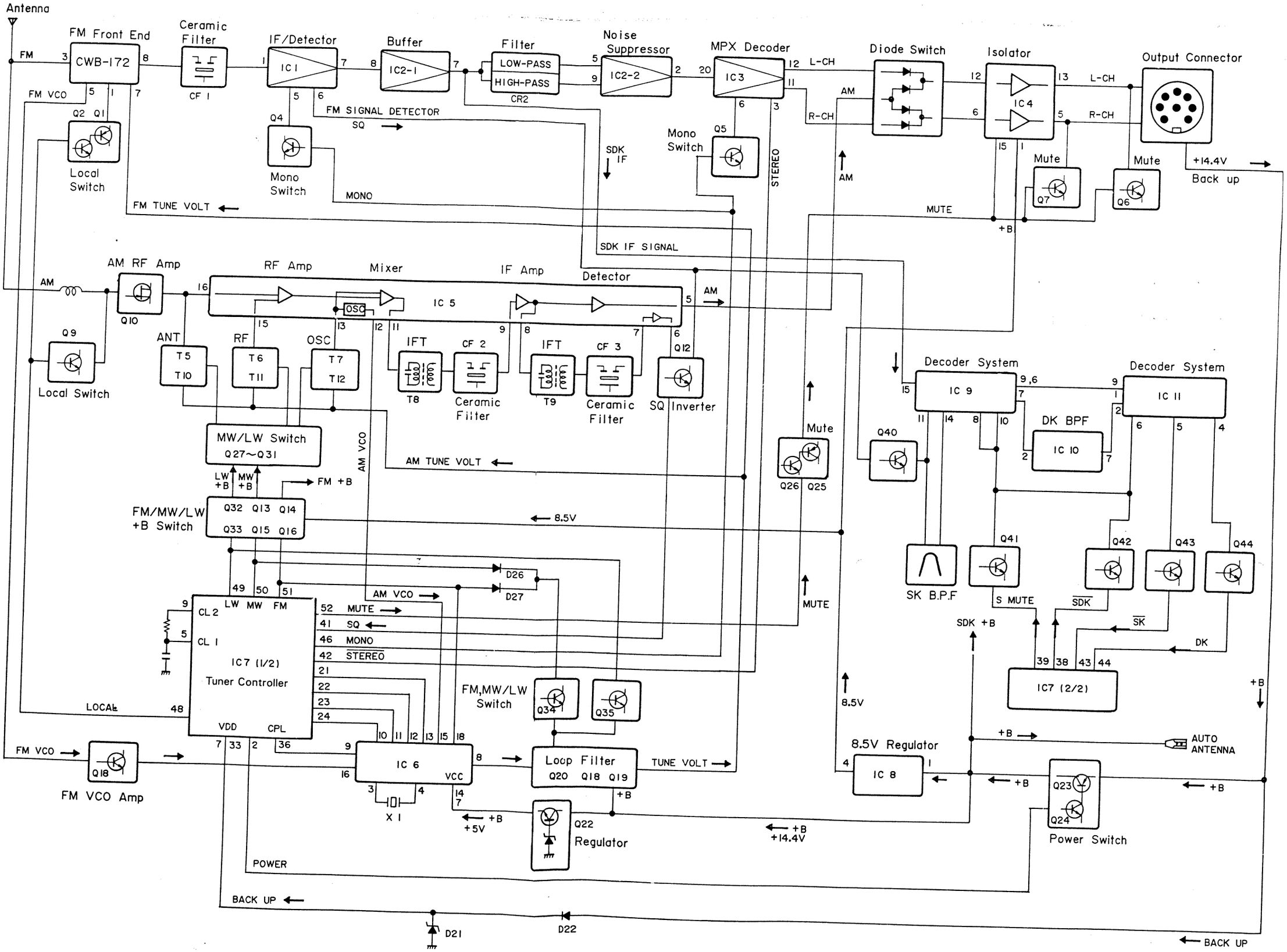

Antenna
FM
FM Front End
CWB-172
FM VCO
Q2 Q1
Local Switch
Ceramic Filter
CF 1
IF/Detector
IC 1
SD
SQ
Q4
Mono Switch
MONO
Buffer
IC2-1
Filter
LOW-PASS
HIGH-PASS
CR 2
Noise Suppressor
IC2-2
MPX Decoder
IC 3
Q5
Mono Switch
L-CH
AM
R-CH
Diode Switch
Isolator
IC 4
Output Connector
L-CH
R-CH
Mute
Q7
Mute
Q6
+B
MUTE
FM TUNE VOLT
Back up +14.4v
AM
AM RF Amp
Q10
RF Amp
Mixer
IF Amp
AM Detector
IC 5
OSC
Q9
Local Switch
ANT
T5
T10
RF
T6
T11
OSC
T7
T12
T8
IFT
CF 2
Ceramic Filter
T9
IFT
CF 3
Ceramic Filter
Q12
SQ Inverter
SQ
AM TUNE VOLT
MW/LW Switch
Q27~Q31
LW +B
MW +B
FM +B
AM VCO
8.5V
+B
AUTO ANTENNA
8.5V Regulator
IC 8
Power Switch
+14.4V
Q23
Q24
FM/MW/LW +B Switch
Q32 Q13 Q14
Q33 Q15 Q16
D26
D27
Q26 Q25
MUTE
Mute Control
LW MW FM
CL 2
CL 1
IC 7
Tuner Controller
MUTE
SQ
MONO
STEREO
LOCAL
VDD
CPL
FM/MW/LW +B Switch
Q34
Q35
FM VCO
Q18
FM VCO Amp
IC 6
VCC
X 1
+5V
Loop Filter
Q20 Q18 Q19
TUNE VOLT
+B
+B 14.4v
Q22
Regulator
POWER
BACK UP
D21
D22
BACK UP

Fig. 4

SCRIPTION

8SDK/WG)



- **Block Diagram (FX-T8/EW)**

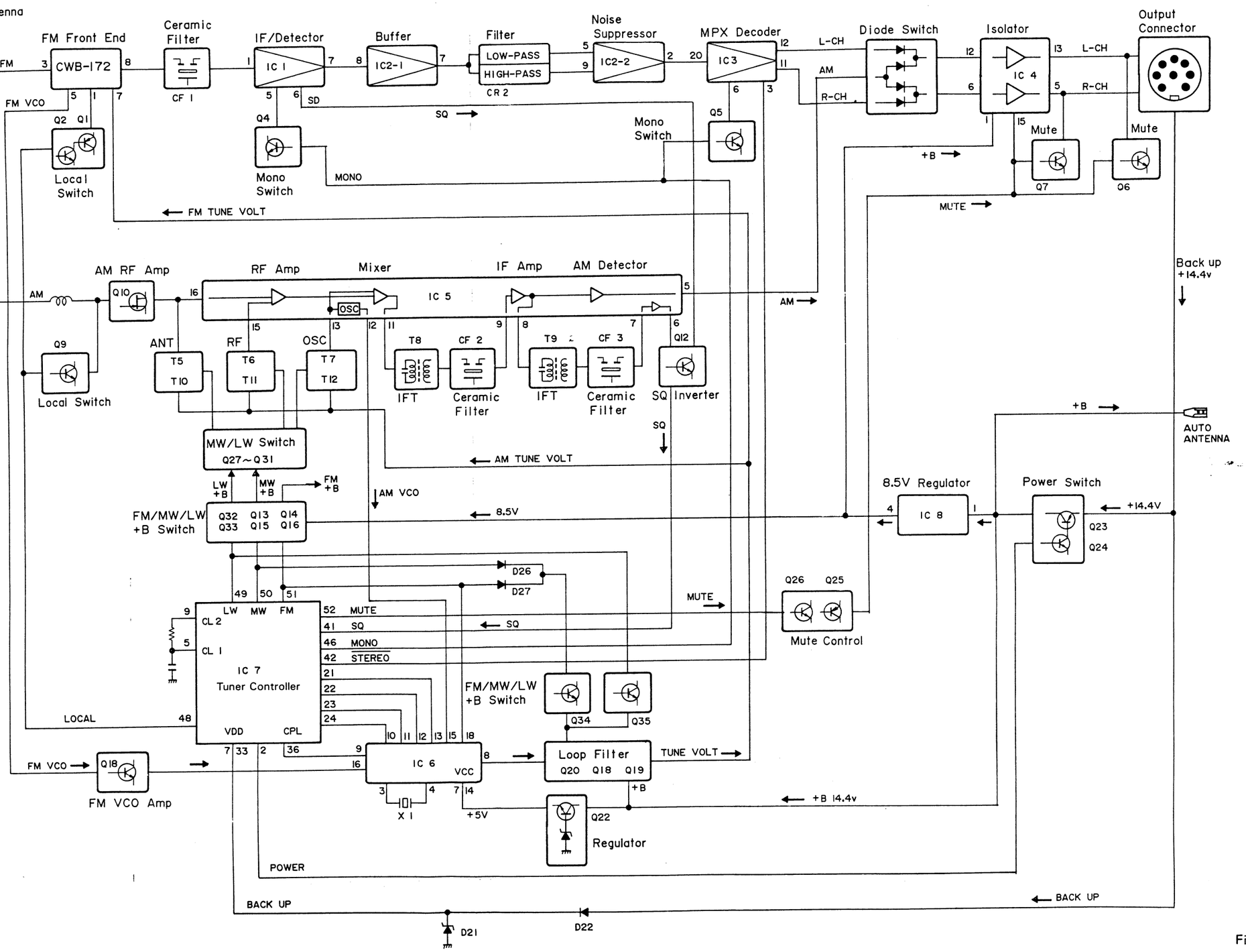


Fig. 4

3. CIRCUIT DESCRIPTION

- **Block Diagram (FX-T8SDK/WG)**

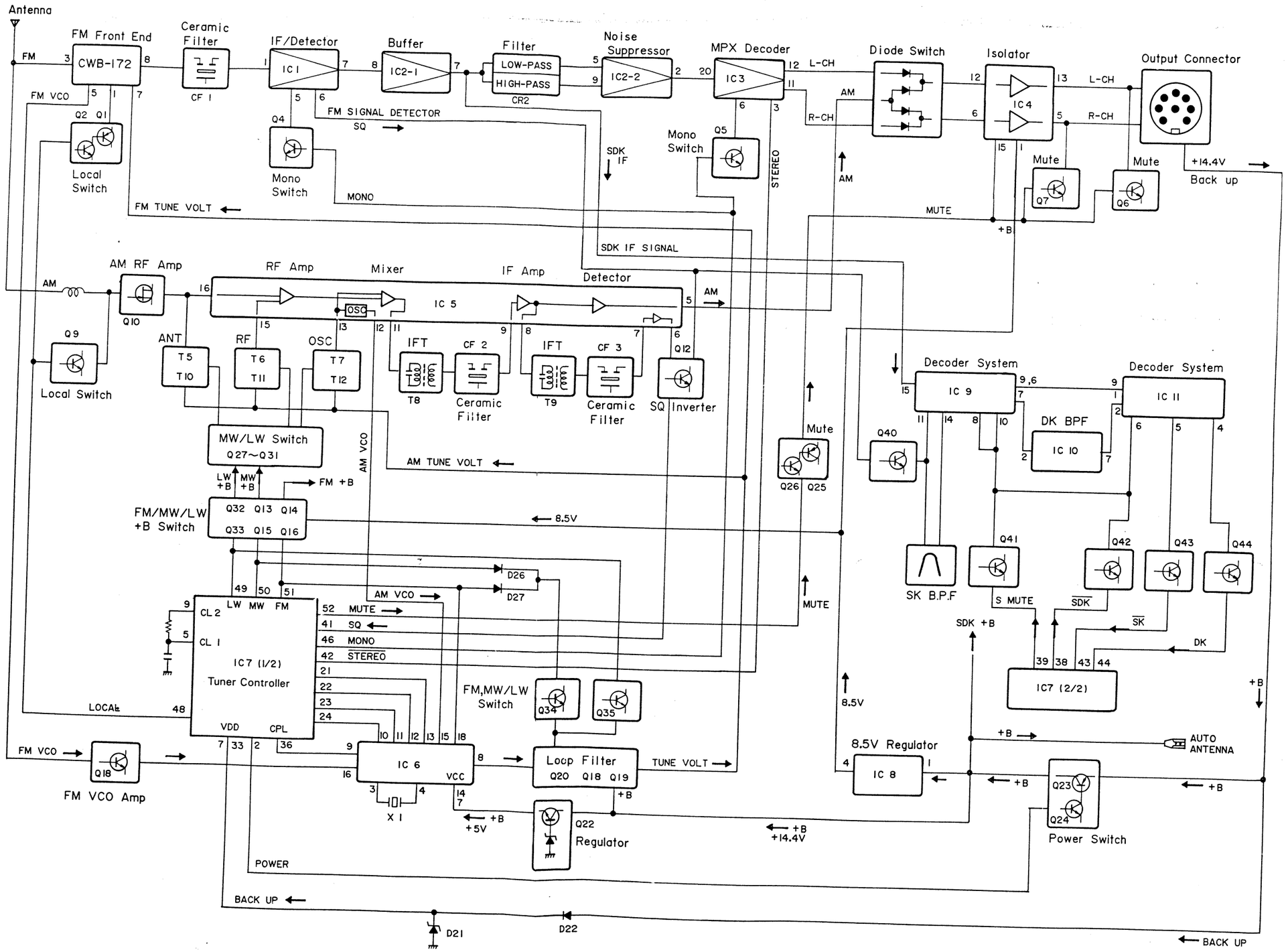


Fig. 3

3.1 FM Tuner Section

• Front End

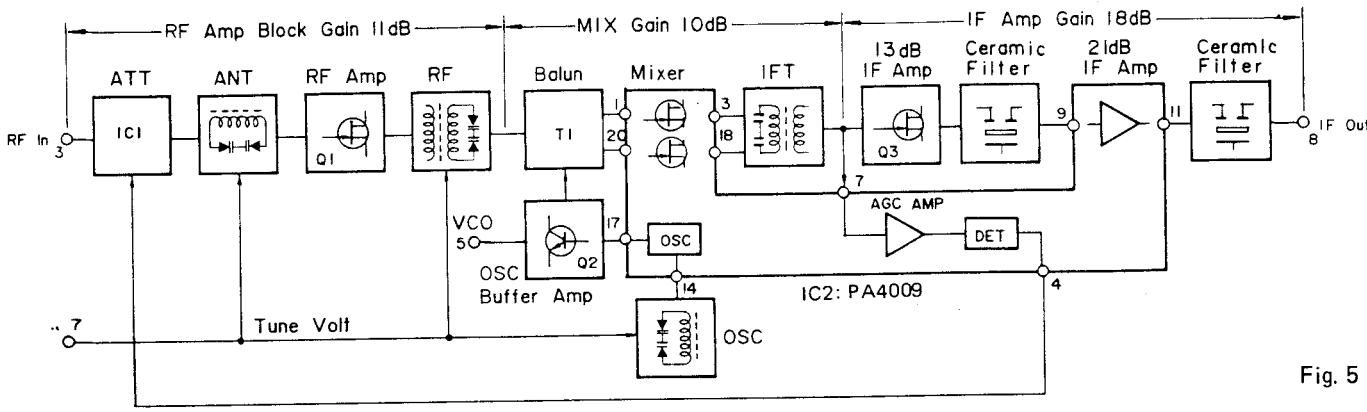


Fig. 5

The RF signal from the antenna passes through an attenuator constructed as a band-pass filter and is sent to the pi-shaped matching circuit, where high-end spurious response is improved. The signal then goes to the next stage, the RF amp. The RF amp employs a MOS FET capable of handling a wide dynamic range. The output from the RF amp passes through a parallel resonance circuit, is converted to a balanced signal from an unbalanced by a balun circuit and then goes to the mixer stage. This is a J-FET single balance type mixer which can accommodate a wide dynamic range. One of the IF signals from the mixer passes through the IF amp and ceramic filters. Another IF signal goes to the AGC amp. This AGC amp can operate even in the presence of interference signals. The AGC amp output is fed back to the RF attenuator circuit, forming a wide loop AGC. The AGC circuit operates at antenna input levels above 65 ±5dB.

• IF Amplifier and Detector

The IF signal (10.7MHz) output from the FM front-end is passed via a ceramic filter (CF1) to pin 1 of the IF amplifier detector IC1 (PA0013).

When there is no signal during the scanning operation, an output of 2 to 3V is obtained from pin 6 of IC1. Q12 is thus turned on, resulting in pin 41 of the control IC (IC7) being set to 0V to ensure that scanning is continued. When an input signal is received, pin 6 of IC1 is set to 0V, pin 41 of IC7 is set to "H", and scanning is stopped. A DC voltage which varies according to the level of the input signal is obtained from pin 17 of IC1, and is applied to pins 18 and 19 (stereo decoder output high-cut control pins) and pin 17 (separation pin) of IC3 (PA0015).

• PNS Circuit

IC2 (PA0014) is the FM noise canceller IC.

• FM MPX Circuit

IC3 (PA0015) is the PLL FM multiplex stereo decoder IC. When the composite stereo input signal accompanying the 19kHz pilot signal is applied, the VCO in the IC is locked to 19kHz and separates the left and right channel signals by the 38kHz switching signal.

• ARC MK V

In contrast to the earlier ARC MKIII (revised), control of separation and high-cut by both input level and input noise in the ARC MKV enables suppression of multipath noise when the input level is high. And when the input level is less than 35dB, the noise detector signal is stopped (for ARC by input level only).

3.2 AM Tuner Section

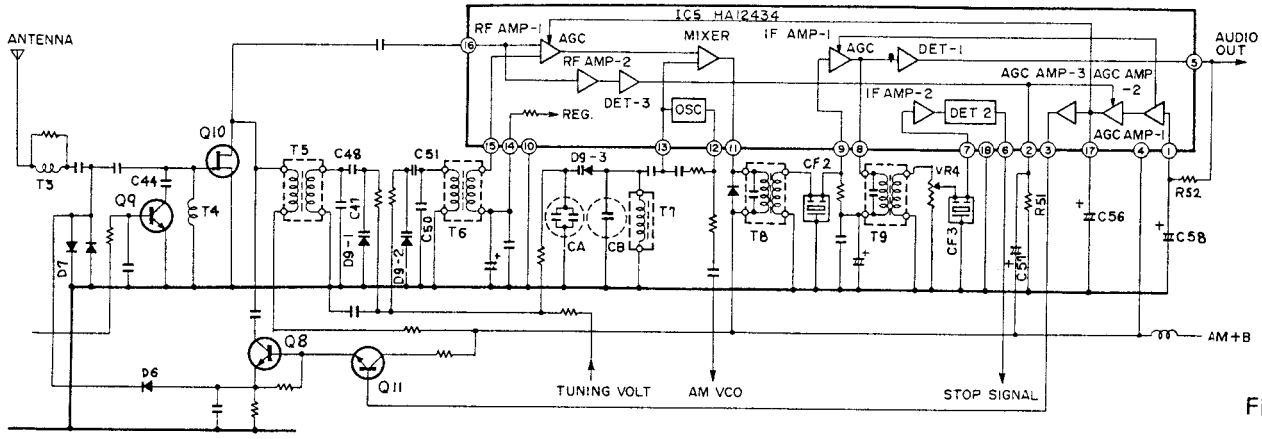


Fig. 6

IC HA12434 used in this unit is designed for electronic tuning and provided with the output circuit of the stop signals for seeking and VCO buffer. Its feature includes a wide-band AGC.

1. RF amplifier section

This section performs a single-tuning 2-stage RF amplification. The first stage is a narrow-band amplifier section consisting of Q10 and its load, i.e., resonance circuit (inductance of T5, and capacitance of varicap diode D9-1, C47). The second stage is a section consisting of RF amplifier 1 inside the IC and its load, or resonance circuit (inductance of T6, and capacitance of D9-2, C50). Pin 15 is not only a terminal lead to which the load of RF amp 1 is connected, but also an input terminal pin of the mixer input.

2. VCO section

The VCO (voltage-controlled oscillator) oscillates at its resonant frequency by the feedback circuit from pin 12 to pin 13 and the resonant circuit connected to pin 13. The resonant frequency is determined by the inductance of T7 and the composite capacitance of CA, CB, and D9-2. CA is a padding capacitor connected in series with capacitance-varying varicap diode D9-3, and CB is a capacitor connected in parallel with varicap diode depending on its grade. All this contributes to better tracking with the RF stage.

3. Mixer section

The VCO output frequency from the VCO section and the input signal from RF amp 1 are mixed together at the mixer section to produce the IF component (450 kHz).

4. IF section

The intermediate frequency section consists of the IF filter (450 kHz) by T8 and CF2, the IF amp 1 and the IF filter by T9. Pin 8 is not only a load connecting terminal of the IF amp but also an input terminal of detector circuit 1.

5. Detector section

Pin 8 is connected to the detector and provides an output to pin 5, audio output. This output contains both audio frequency component (AC) and DC component.

6. AGC section (AGC by the reception frequency)

The DC component of the detector output at pin 5 is detected by AGC amp 1 at pin 1 by passing it through the filter consisting of R52 and C58. The AGC starts operating at an input level close to the maximum sensitivity. The output of AGC amp 1 is connected to AGC amp 2, and controls the gain of RF amp 1.

The AGC voltage is developed at pin 3 through AGC amp 3, and current flows through D6 and D7, lowering the impedance. As a result, attenuation is effected.

When Q8 turns on and the load impedance of the drain of Q10 is lowered, attenuation is effected. These attenuations due to the decrease in impedance enable AGC operation. The input level to develop a voltage at pin 3 is about 55dBμV during reception of MW 999 kHz. Thanks to the AGC operation mentioned above, the output variation characteristics against input variation are broader than the conventional AM characteristics.

7. AGC section (wide-band AGC)

The wide-band AGC is to control the gain of the RF amplifier section when the input RF level at pin 16 is high. This is intended to prevent interference due to the saturations of RF amp Q10, RF amp 1 in the IC, etc. Caused by a large input other than the reception frequency.

Operation is as follows: A DC voltage corresponding to the level of the input RF is developed at pin 2 by amplifying and detecting the RF signal from pin 16 by RF amp 2 and detector 3 respectively. This is delayed by the time constant of C57 and the gain of this portion is determined by R51. By applying this DC voltage to AGC amp 2, the AGC at RF amp 1 and AGC at Q8, D6 and D7 are effected.

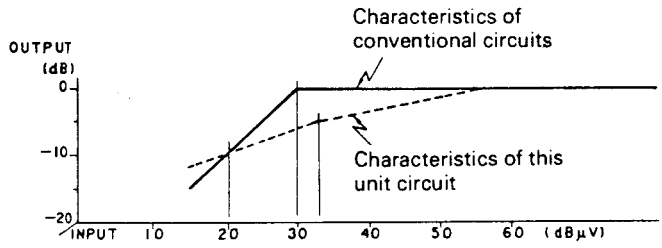


Fig. 7

8. **Stop signal**
The stop signal for seek operation is produced by extracting the IF signal from the secondary winding of T9 and adjusting its level by VR4. This signal is connected via 450kHz filter CF3 from pin 7 to IF amp 2 to detector2. This output appears at pin 6 and becomes 0V during reception.

9. **Local station/distant station seek**
During local station seek, Q9 turns on, whereby C44 is grounded. The impedance of C44 allows attenuation in the antenna system.

4. ADJUSTMENT

4.1 FM IF ADJUSTMENT

- **Connection Diagram**

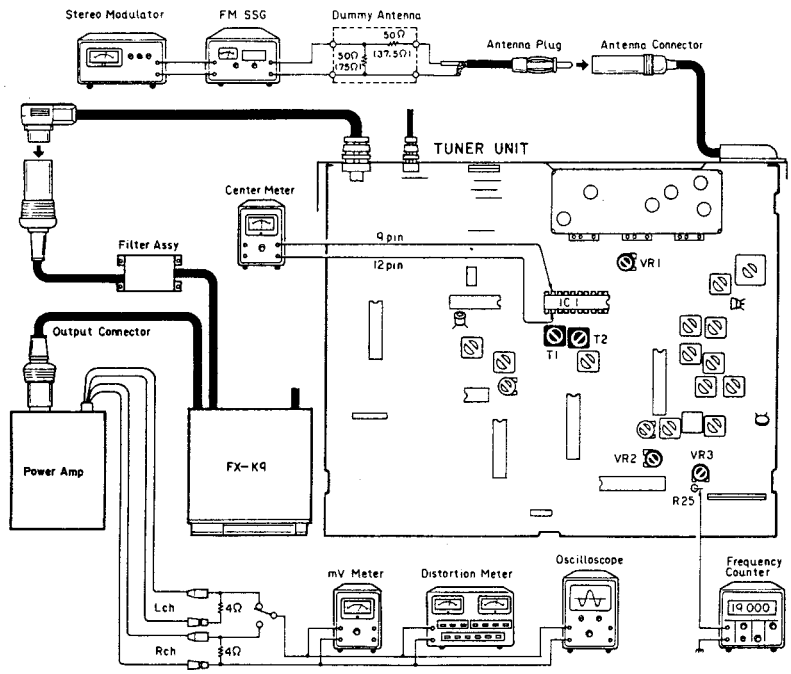


Fig. 8

- **To Adjust**

1. Apply a 98MHz, 400Hz 100% modulated 60dB (μV) signal from the FM SSG, and tune the tuner to 98MHz.
2. Adjust T1 to obtain a 0 reading in the center meter.
3. Adjust T2 to the point of minimum distortion.

4.2 FM MPX ADJUSTMENT

- **Connection Diagram**

(Shown in Fig. 8)

- **To Adjust**

1. Apply a 98MHz 60dB (μV) unmodulated signal from the FM SSG, and adjust VR3 to obtain frequency counter reading of 19kHz ± 120Hz.
2. Apply the stereo signal (1kHz, 100% modulated), and adjust VR2 to the point of maximum separation.
3. Apply an input signal of 35dB (μV), and adjust VR1 to a separation of 5dB.

4.3 FM TRACKING ADJUSTMENT

- **Connection Diagram**

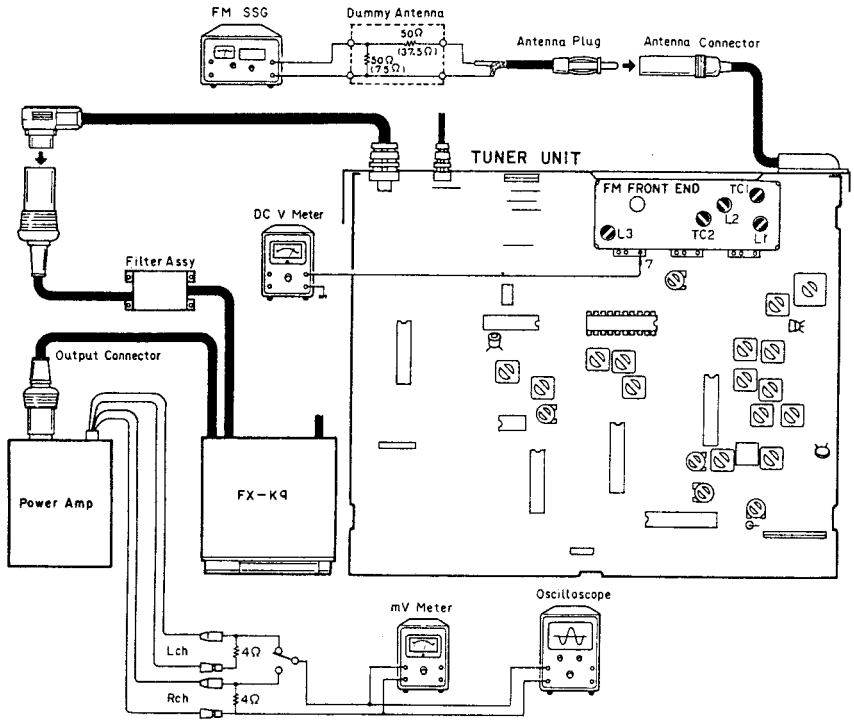


Fig. 9

- **To Adjust**

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	107.9 MHz	L3	7.6 ± 0.3V	
2.	88.1 MHz	For confirmation Only	2.2 ± 0.5V	
3. 90 MHz (400 Hz, 100% modulation) output level 10 dB (μV)	90 MHz	L1, L2		Maximum output
4. 106 MHz (400 Hz, 100% modulation) output level 10 dB (μV)	106 MHz	TC1, TC2		Maximum output
5. Repeat items (3) and (4) alternately so that the mV meter indicates maximum output.				

4.4 AM IF ADJUSTMENT

• Connection Diagram

IF Generator Scope
Sweep center frequency . . . . . 450 kHz
Input gain . . . . . 0.3 V p-p/cm

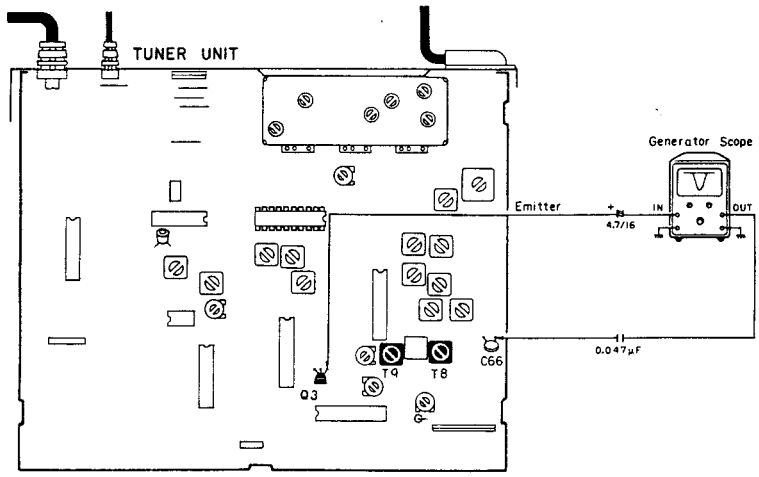


Fig. 10

• To Adjust

1. Set the input the generator scope to the range within which the U curve can be verified and move the coil of T8 and T9 until the U curve is adjusted to its maximum amplitude and optimum symmetry.

4.5 AM TRACKING ADJUSTMENT

- **Connection Diagram**

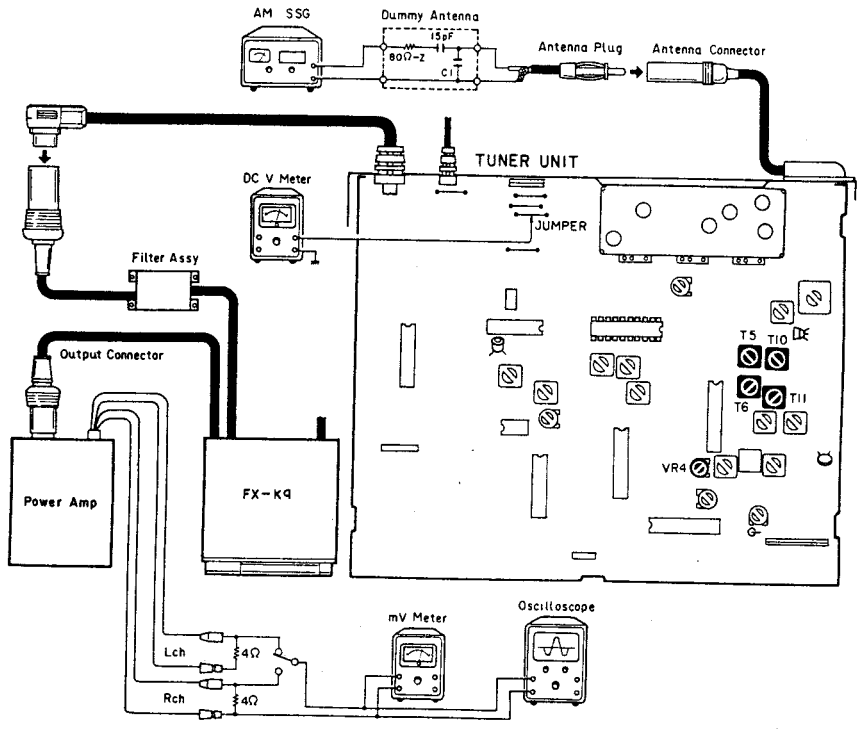


Fig. 11

NOTICE:
Select C1 so that the total capacity of 80pF is attained from the direction of the receiver jack.
Z: Output impedance of the SSG.

- **To Adjust (In case of MW)**

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	531 kHz	For Confirmation Only	More than 0.8V	
2. 603 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	603 kHz	T5, T6		Maximum output
3.	1,602 kHz	For Confirmation Only	More than 8.5V	

- **To Adjust (In case of LW)**

Frequency of AM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	153 kHz	For Confirmation Only	More than 2.5V	
2. 218 kHz (400 Hz, 30% modulation) output level 25 dB (μV)	218 kHz	T10, T11		Maximum output
3.	281 kHz	For Confirmation Only	More than 8.5V	

4.6 AM SEEK STOP SENSITIVITY ADJUSTMENT

- **Connection Diagram**

  (Shown in Fig. 11)

- **To Adjust**

  1. Set output level of AM SSG at 24dB (μV).
  2. Carry out "SEEK" at DX state and adjust VR4 until "SEEK" stops.

4.7 DECODER ADJUSTMENT (FX-T8SDK/WG)

- **Connection Diagram**

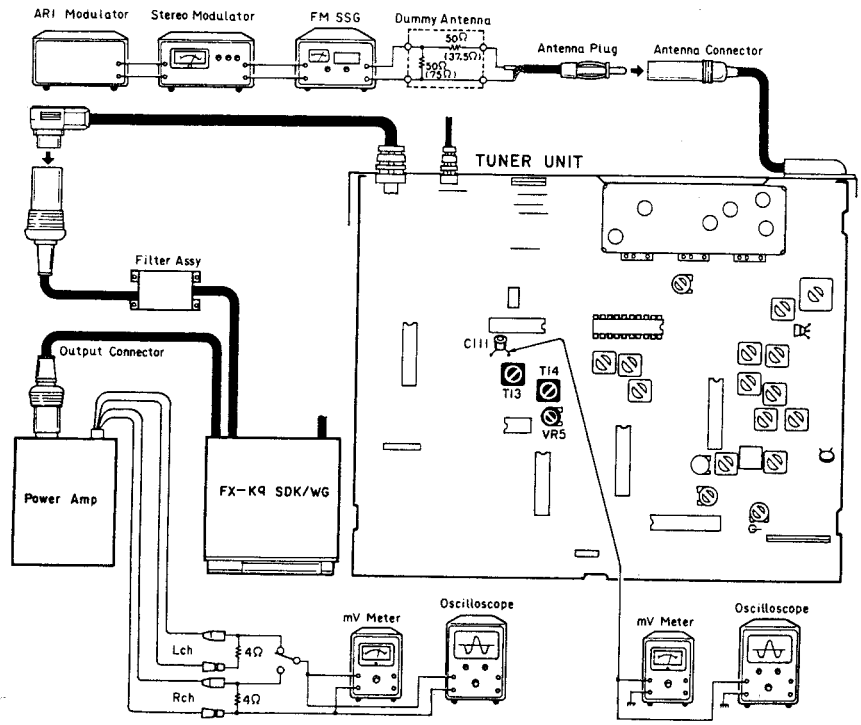


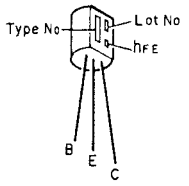
Fig. 12

- **To Adjust**

  1. Carrier : 98 MHz
     Modulation (SK) : 57kHz, 5%
     Modulation (Audio) : OFF
     SSG Output : 60dB (μV)
  2. Adjust T13 and T14 so that the amplitude of indicator of mV meter connect to C111 becomes maximum.
  3. Modulation (Audio) : 400Hz, 60%
     Modulation (SK) : 57kHz, 5%
     SSG Output : 14dB (μV)
  4. Adjust VR5 so that SK indicator lights on.

• ICs and Transistors

2SC2570



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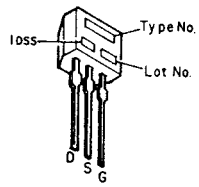

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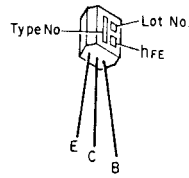

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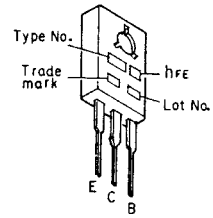

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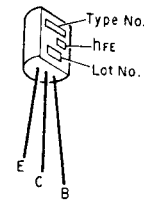

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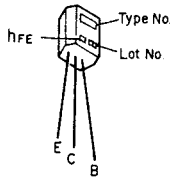

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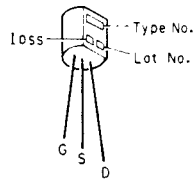

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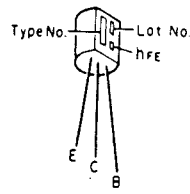

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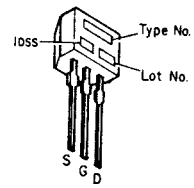

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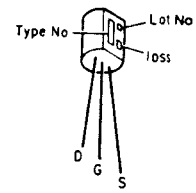

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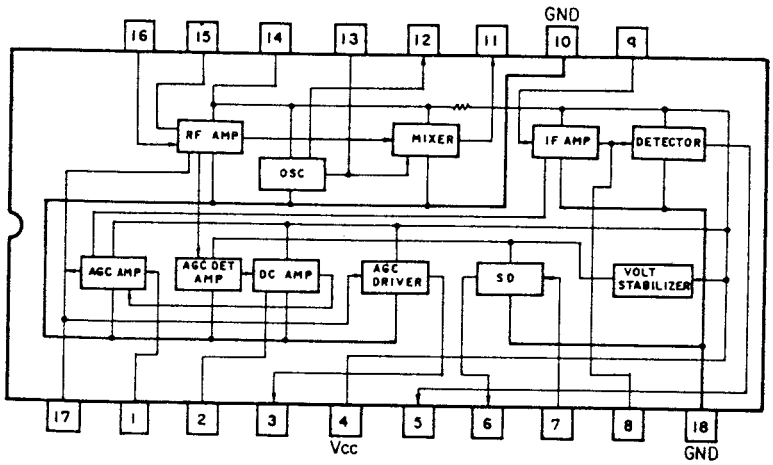
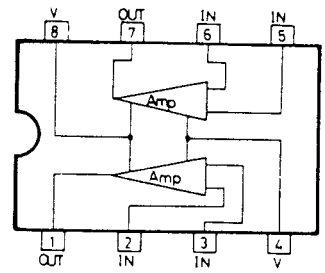


TA75558P



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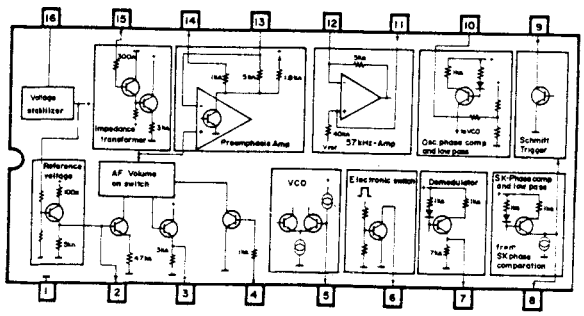
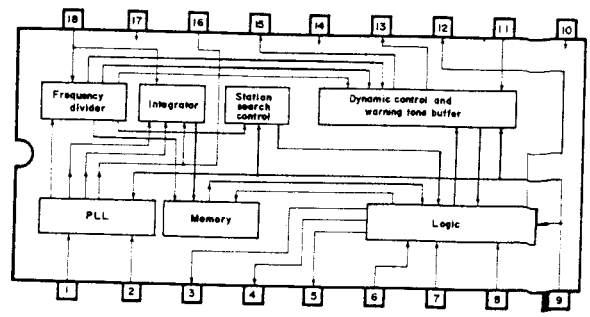
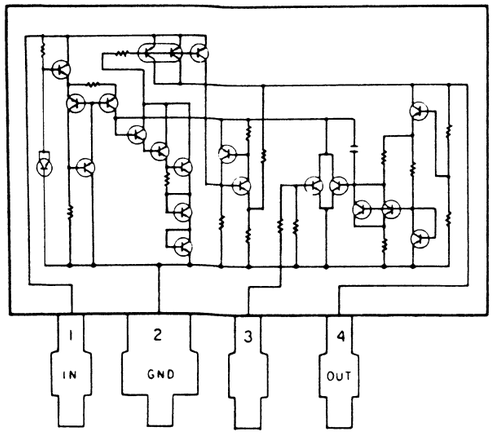


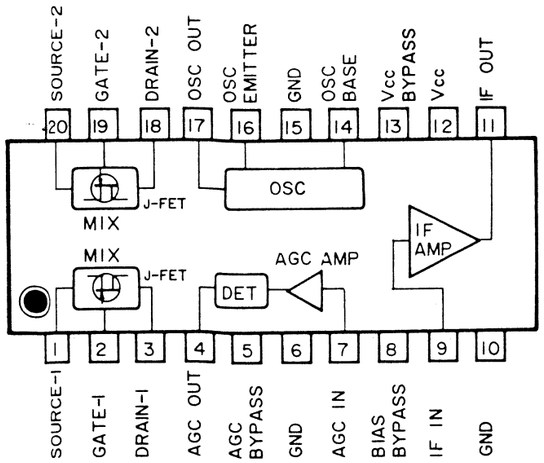
S551



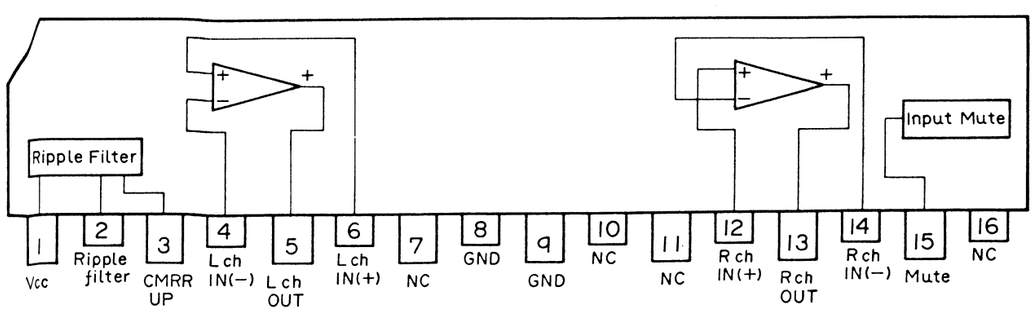
AN6540



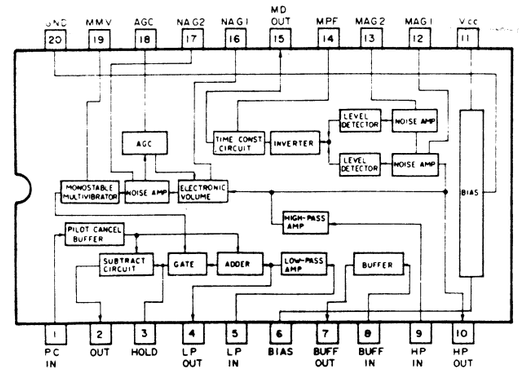
PA4009



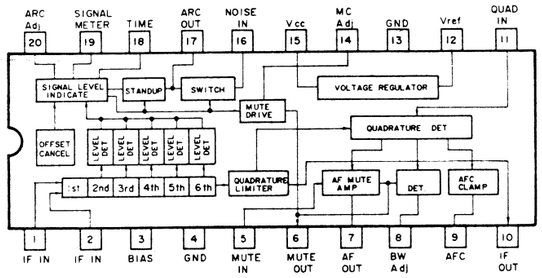
PA2014



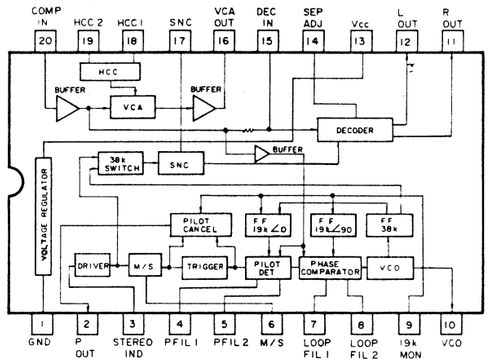
PA0014



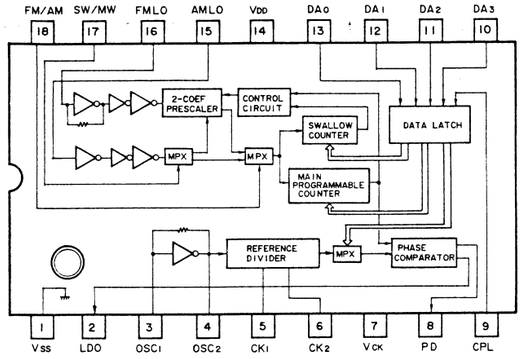
PA0013



PA0015



MN6147



Pin Functions (MN6147)

Pin No.	Pin Name	I/O	Function and Operation
1	VSS		GND
2	LDO (QO)	Output	Lock detector output (oscillator circuit output)
3	OSC1		4.5 MHz crystal oscillation
4	OSC2		
5	CK1	Output	Clock output 1
6	CK2	Output	Clock output 2 (250 Hz)
7	VCK		Battery back-up for frequency divider circuit (5V).
8	PD	Output	Phase detector output (3-state)
9	CPL		Latch clock
10	DA3	Input	Data and address input (MSB)
11	DA2	Input	Data and address input
12	DA1	Input	
13	DA0	Input	Data and address input (LSB)
14	VDD		Power supply 5V.
15	AMLO	Input	AM local oscillating signal input
16	FMLO	Input	FM local oscillating signal input
17	SW/MW		SW/MW changeover
18	FM/AM		FM/AM changeover

Pin Functions

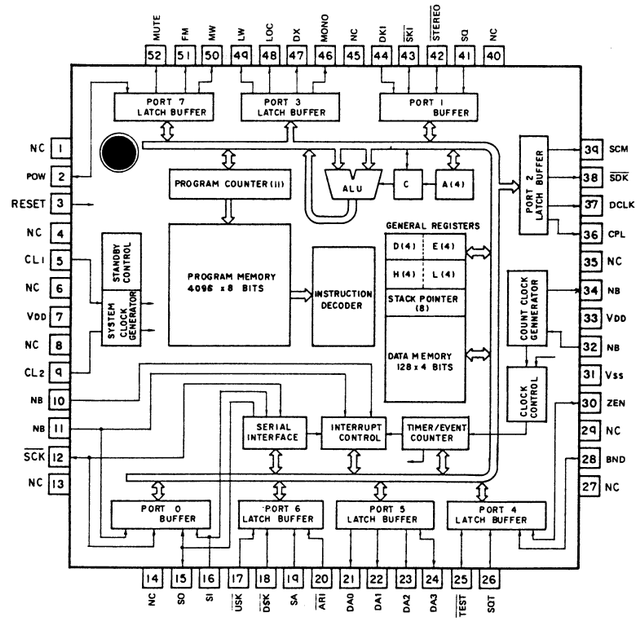
Pin No.	Pi
1	NC
2	POW
3	RESE
4	NC
5	CL1
6	NC
7	VDD
8	NC
9	CL2
10	NB
11	NB
12	$\overline{SCK}$
13	NC
14	NC
15	SO
16	SI
17	$\overline{USK}$
18	$\overline{DSK}$
19	SA
20	$\overline{ARI}$
21	DA0
22	DA1
23	DA2
24	DA3
25	$\overline{TEST}$
26	SQT
27	NC
28	BND
29	NC
30	ZEN
31	VSS
32	NB
33	VDD
34	NB
35	NC
36	CPL
37	DCLK
38	$\overline{SDK}$
39	SCM
40	NC
41	SQ

in Functions (PD4046A)

Pin No.	Pin Name	I/O	Function and Operation
1	NC		
2	POW	Output	Power supply control output. Active "H".
3	RESET	Input	Hardware reset input. Active "H".
4	NC		
5	CL1	Input	System clock oscillator circuit. CR pin.
6	NC		
7	VDD		Power supply pin. +5V.
8	NC		
9	CL2	Output	System clock oscillator circuit. CR pin.
10	NB	Input	Set to GND level.
11	NB	Input	Set to GND level.
12	$\overline{SCK}$		Shift clock I/O pin for serial interface.
13	NC		
14	NC		
15	SO	Output	Serial inteface data output pin.
16	SI	Input	Serial inteface data input pin.
17	$\overline{USK}$	Input	Up-seek switch input. Active "L".
18	$\overline{DSK}$	Input	Down-seek switch input. Active "L".
19	SA	Input	FM IF offset changeover. "L" level.
20	$\overline{ARI}$	Input	Input pin for SDK function. "H" level . . . . . SDK function ineffective. "L" level . . . . . SDK function effective.
21	DA0	Output	LSB
22	DA1	Output	PLL IC (MN6147) control data output pin.
23	DA2	Output	
24	DA3	Output	MSB
25	$\overline{TEST}$	Input	Input pin for test program execution. Provides test program mode at "L" level with power on reset.
26	SQT	Input	Scan stop signal sensing time change over input pin.
27	NC		
28	BND	Input	2-BAND/3-BAND changeover input pin. "H" level . . . . . 3-BAND "L" level 2-BAND
29	NC		
30	ZEN	Input	Input pin used to cancel "0" button"function by means of "preset memory call" provided by remote-control unit. Cancelled at "L" level.
31	VSS		Power supply pin. GND
32	NB	Input	VDD or VSS level.
33	VDD		Power supply pin. +5V
34	NB	Output	Open
35	NC		
36	CPL	Output	PLL IC (MN6147) control data latch pulse output pin.
37	DCLK	Output	100Hz duty 50% pulse output with tuner ON.
38	$\overline{SDK}$	Output	SDK ON/OFF output. Provides "H" level output normally; provides "L" level with SDK ON.
39	SCM	Output	SDK scan mute output. Provides "H" level output while PLL control data is set.
40	NC		
41	SQ	Input	Scan stop signal input. Active "H".

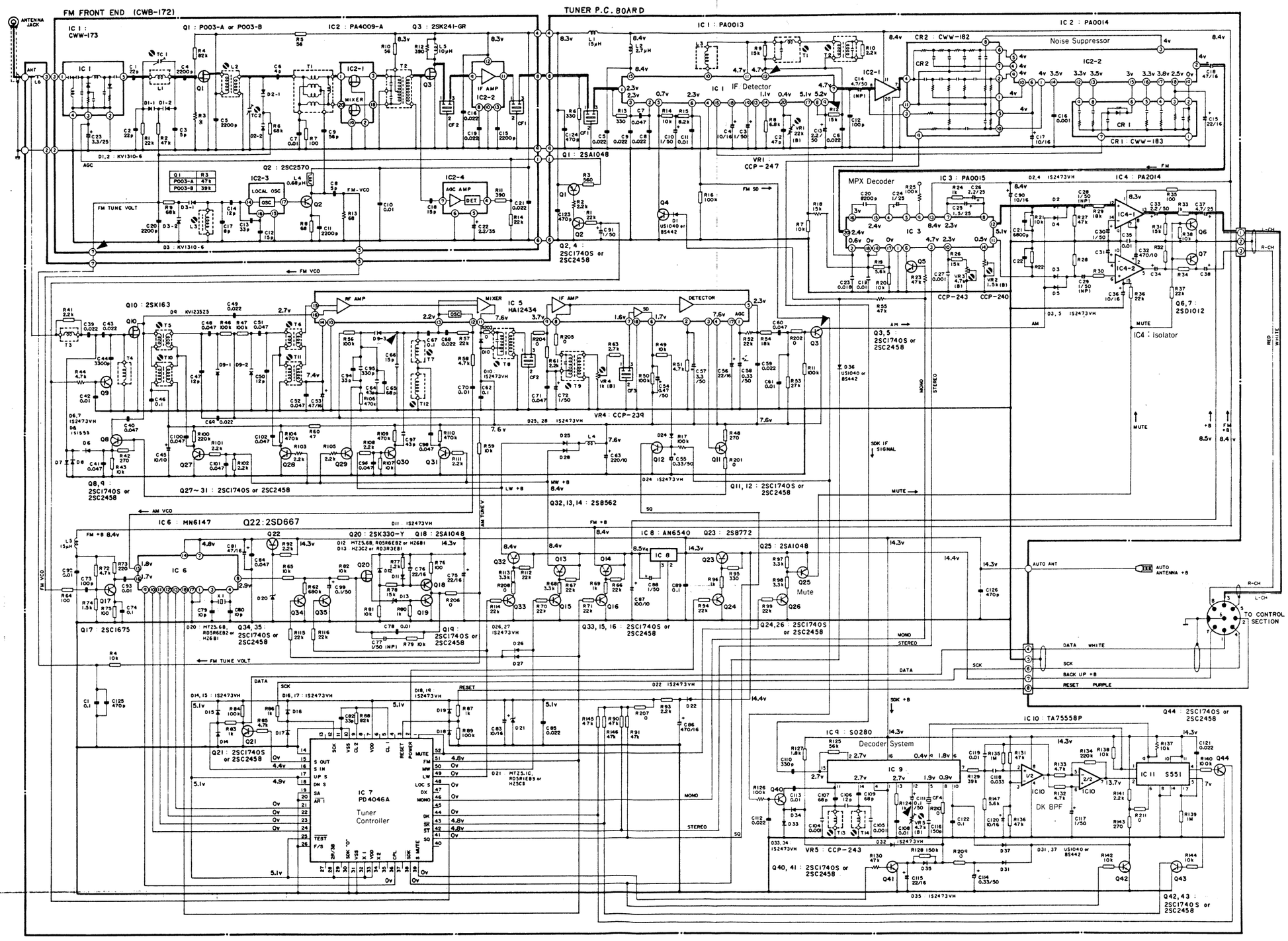
Pin No.	Pin Name	I/O	Function and Operation
42	$\overline{STEREO}$	Input	FM stereo indicator input. Stereo indicator lights up at "L" level during FM reception (at AUTO mode).
43	$\overline{SKI}$	Input	SDK/SK signal input terminal.
44	DKI	Input	SDK/DK signal input terminal.
45	NC		
46	MONO	Output	FM AUTO/MONO changeover output. MONO at "H" level.
47	DX	Output	Scan stop sensitivity changeover output. Provides "H" level output while scanning with LOC.S OFF
48	LOC	Output	Scan stop sensitivity changeover output. Provides "H" level output while scanning with LOC.S ON.
49	LW	Output	Band changeover control output. Provides "H" level during LW reception.
50	MW	Output	Band changeover control output. Provides "H" level during MW reception.
51	FM	Output	Band changeover control output. Provides "H" level during FM reception.
52	MUTE	Output	Mute signal output. Active "H".

***PD4046A**



*IC's marked by *are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

5. SCHEMATIC CIRCUIT DIAGRAM (FX-T8SDK/WG)



IC 1			
1	2	3	4
2.3V		2.3V	0V
11	12	13	14
4.7V	4.7V	0V	1.1V

IC 2			
1	2	3	4
4V	4V	4V	4V
11	12	13	14
8.4V	3.3V	3.5V	3.5V

IC 3			
1	2	3	4
0V	0.6V	4.7V	
11	12	13	14
5.1V	5.1V	8.4V	0.5V

IC 4			
1	2	3	4
8.3V			
9	10	11	12
0V	0V		

IC 5			
1	2	3	4
			7.6V
11	12	13	14
7.6V		2.2V	7.4V

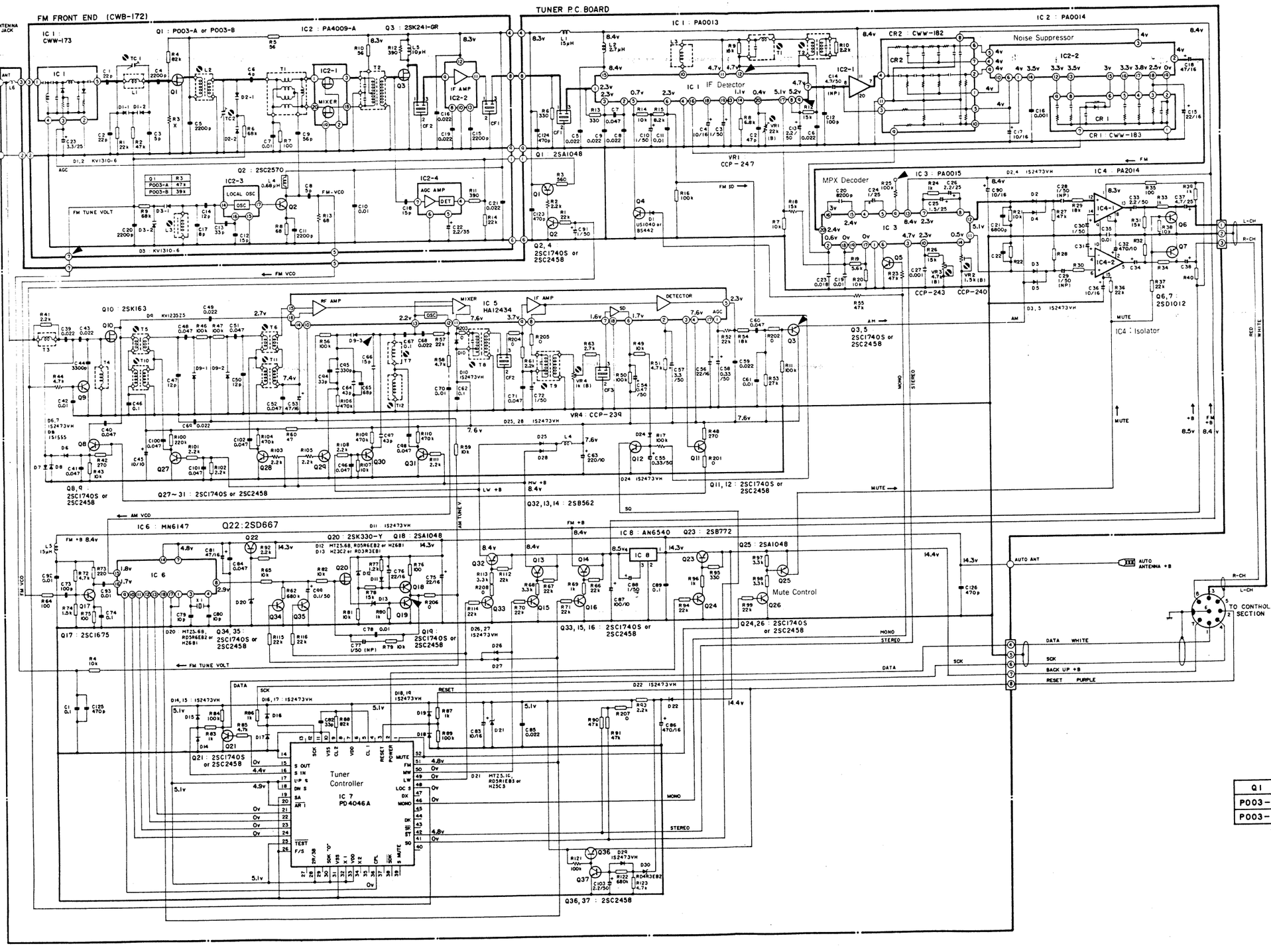
Q1	R3
P003-A	47k
P003-B	39k

IC,Q IC1 Q
ADJ L1 TC1

IC1 : CWW-1
Q3 : 2SK241-

Fig. 13

7. SCHEMATIC CIRCUIT DIAGRAM (FX-T8/EW)



Q1	R3
P003-A	47k
P003-B	39k

Fig. 15

8. CONNECTI

IC 1

1	2	3	4	5	6	7	8
2.3V		2.3V	0V	0.7V	2.3V	4.7V	5.2V
11	12	13	14	15	16	17	18
4.7V	4.7V	0V	1.1V	8.4V		5.1V	

IC 2

1	2	3	4	5	6	7	8
4V	4V	4V	4V	4V	4V		
11	12	13	14	15	16	17	18
8.4V	3.3V	3.5V	3.5V	3V	3.3V	3.8V	2.5V

IC 4

1	2	3	4	5	6	7	8
8.3V						0V	0V
9	10	11	12	13	14	15	16
0V	0V						

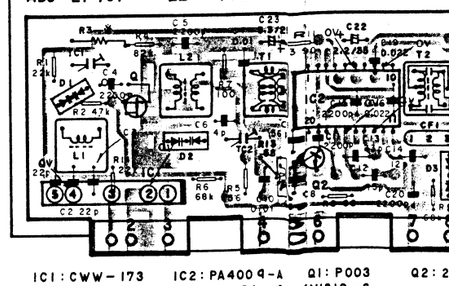
IC 5

1	2	3	4	5	6	7	8
			7.6V	2.3V	1.7V	1.6V	
11	12	13	14	15	16	17	18
7.6V		2.2V	7.4V		2.7V		0V

FM FRONT END(CWB-172)

IC,Q IC1 Q1 Q2 IC2

ADJ L1 TC1 L2 TC2 T2



IC1 : CWW-173 IC2 : PA4009-A Q1 : P003 Q2 : 2
Q3 : 2SK241-GR D1 ~ 3 : KV1310-6

6. CONNECTION DIAGRAM (FX-T8SDK/WG)

2	3	4	5	6	7	8	9	10
	2.3V	0V	0.7V	2.3V	4.7V	5.2V	5.2V	
12	13	14	15	16	17	18	19	20
7V	0V	1.1V	8.4V		5.1V			0.4V

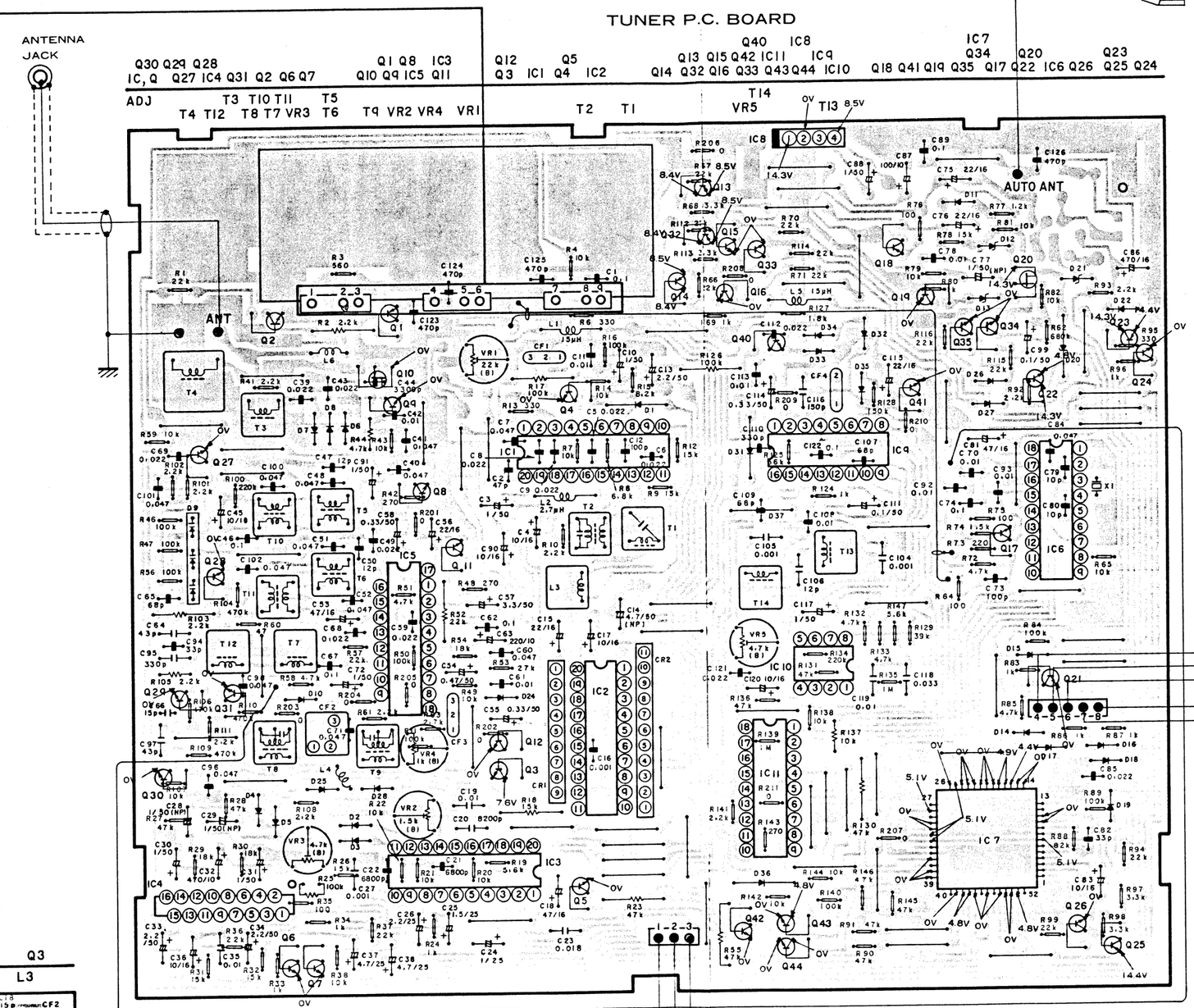
2	3	4	5	6	7	8	9	10
V	4V	4V	4V	4V			4V	4V
12	13	14	15	16	17	18	19	20
3V	3.5V	3.5V	3V	3.3V	3.8V	2.5V	0V	0V

2	3	4	5	6	7	8	9	10
6V	4.7V				2.3V			2.3V
12	13	14	15	16	17	18	19	20
1V	8.4V	0.5V	2.4V	3V	0V	0V	0V	2.4V

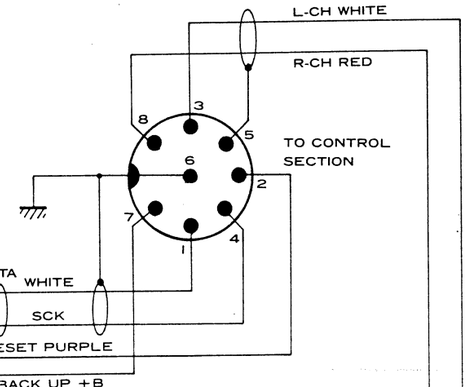
2	3	4	5	6	7	8
					0V	0V
10	11	12	13	14	15	16
0V						

2	3	4	5	6	7	8	9	10
		7.6V	2.3V	1.7V	1.6V		3.7V	0V
12	13	14	15	16	17	18	19	20
	2.2V	7.4V		2.7V		0V	0V	

TUNER P.C. BOARD



IC6								
1	2	3	4	5	6	7	8	9
0V						4.8V	2.9V	0V
10	11	12	13	14	15	16	17	18
0V	0V	0V	0V	4.8V	1.8V	1.7V	0V	4.8V

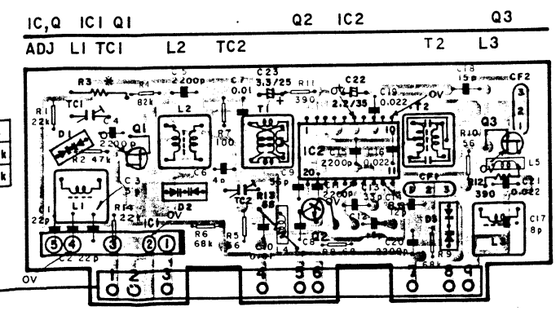


IC9							
1	2	3	4	5	6	7	8
0V	2.7V		0V	1.9V	1.8V		0.9V
9	10	11	12	13	14	15	16
0.4V				2.7V	2.7V	2.7V	14.3V

IC10							
1	2	3	4	5	6	7	8
			0V			13.7V	14.3V

IC11								
1	2	3	4	5	6	7	8	9
1.8V	13.7V			7V			0V	0.4V
10	11	12	13	14	15	16	17	18
14.3V	14.3V			0V				

FM FRONT END(CWB-172)



IC1 : CWW-173 IC2 : PA4009-A Q1 : P003 Q2 : 2SC2570
Q3 : 2SK241-GR D1 ~ 3 : KV1310-6

Fig. 14

18/1

ONNECTION DIAGRAM (FX-T8/EW)

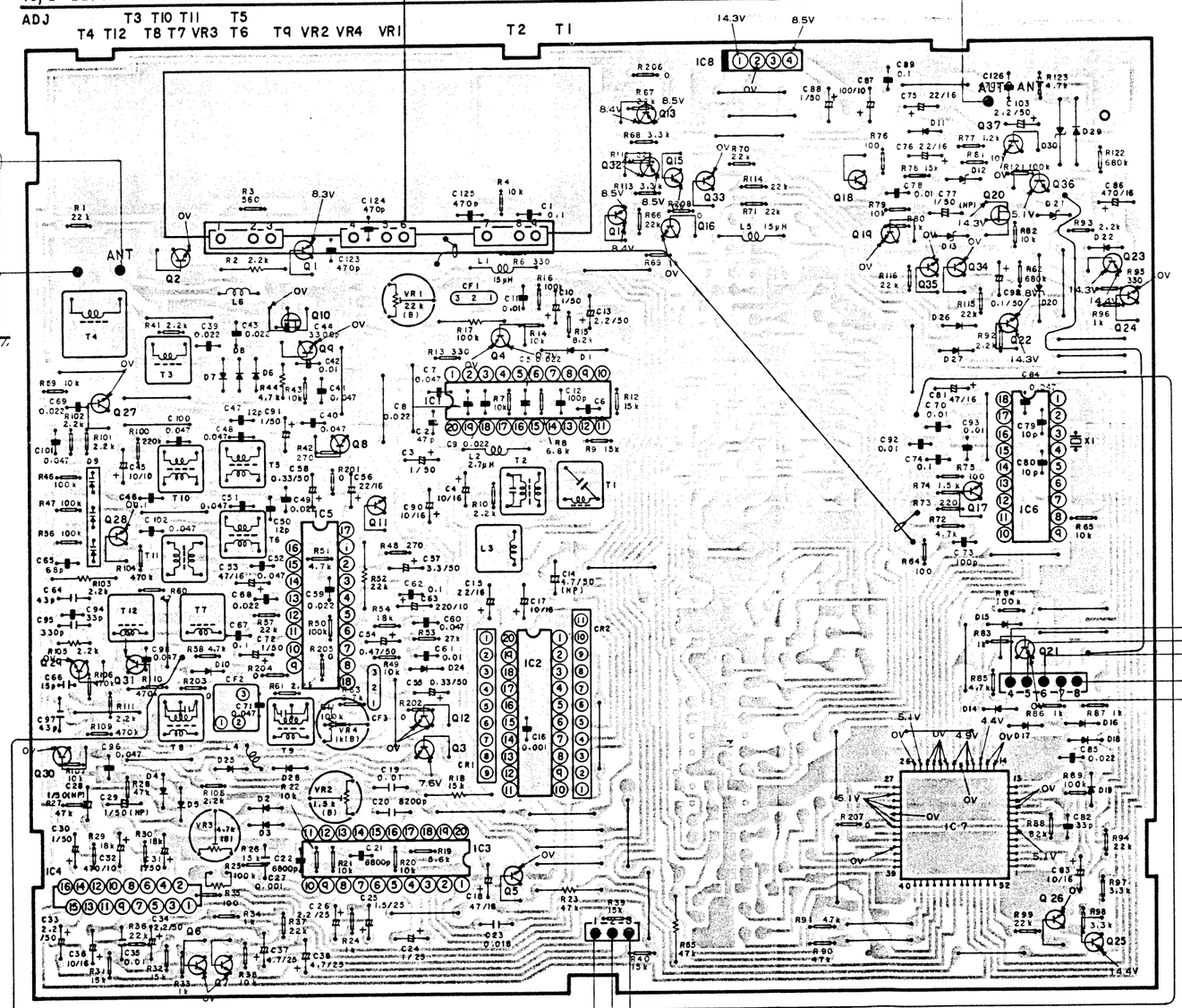
TUNER P.C. BOARD

ANTENNA JACK

AUTO ANTENNA +B

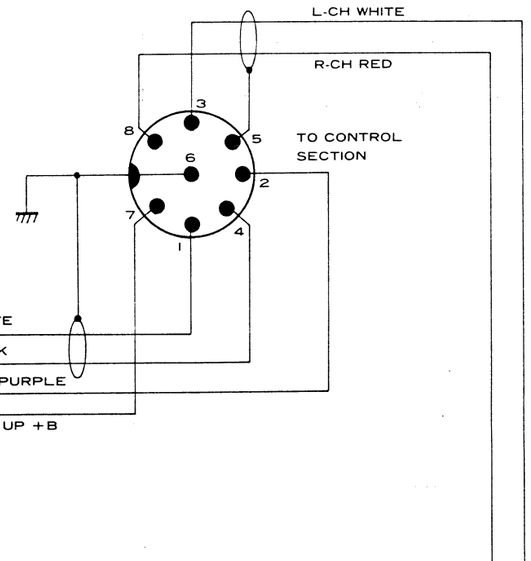
Q30 Q29 Q28 IC, Q Q27 IC4 Q31 Q2 Q6 Q7 | Q1 Q8 IC3 Q10 Q9 IC5 Q11 | Q12 Q3 IC1 Q4 IC2 | Q5 | Q13 Q15 Q14 Q32 Q16 Q33 | IC8 | Q18 | IC7 Q34 Q20 Q37 Q36 Q23 Q19 Q35 Q17 Q22 IC6 Q26 Q25 Q24

ADJ T3 T10 T11 T5 T4 T12 T8 T7 VR3 T6 | T9 VR2 VR4 VR1 | T2 T1



IC6

1	2	3	4	5	6	7	8	9
0V						4.8V	2.9V	0V
10	11	12	13	14	15	16	17	18
0V	0V	0V	0V	4.8V	1.8V	1.7V	0V	4.8V



IC1 : PA0013 IC2 : PA0014 IC3 : PA0015 IC4 : PA2014 IC5 : HAI2434 IC6 : MN6147 IC7 : PD4046A IC8 : AN6540
Q1, 18, 25 : 2SA1048 Q2~5, 8, 9, 11, 12, 15, 16, 19, 21, 24, 26~31, 33~37 : 2SC1740S or 2SC2458 Q6, 7 : 2SD1012 Q10 : 2SK163
Q13, 14, 32 : 2SB562 Q17 : 2SC1675 Q20 : 2SK330-Y Q23 : 2SB772 Q22 : 2SD667
DI, 24 : USI040 or BS442 D2~7, 10, 11, 14~19, 22, 24~29 : IS2473VH D9 : KV1235Z5 DI2, 20 : MTZ5.6B, RD5R6EB2 or HZ6B1 DI3 : HZ3C2 or RD3R3EB1
D21 : MTZ5.1C, RD5R1EB3 or HZ5C3 D30 : HZ4C3 or RD4R3EB2 D8 : IS1555

IC3

1	2	3	4	5	6	7	8	9	10
0V	0.6V	4.7V				2.3V			2.3V
11	12	13	14	15	16	17	18	19	20
5.1V	5.1V	8.4V	0.5V	2.4V	3V	0V	0V	0V	2.4V

Fig. 16

9. EXPLODED VIEW

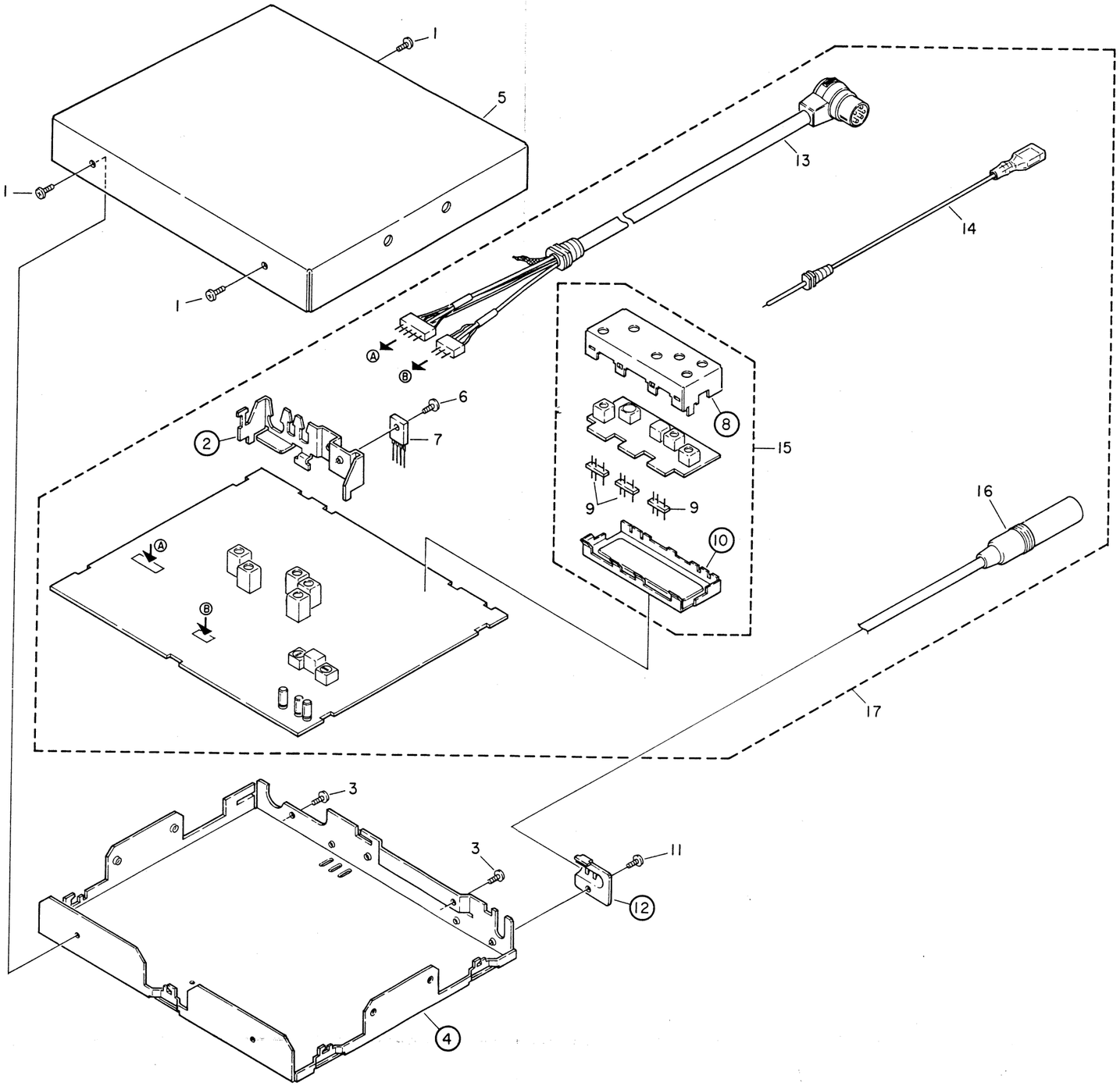


Fig. 17

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

- **Parts List**

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CBA-142	Screw		11.	BMZ30P040FMC	Screw
	2.		Holder		12.		Clamper
	3.	BMZ26P040FMC	Screw		13.	CDF-884	Connector
	4.		Chassis		14.	CDF-885	Cord
	5.	CNB-805	Case		15.	CWB-172	FM Front End
	6.	BMZ30P060FMC	Screw		16.	CDH-069	Antenna Cable
★★	7.	AN6540	IC		17.	CWE-639	Tuner Unit (FX-T8SDK/WG)
	8.		Case			CWE-637	Tuner Unit (FX-T8/EW)
	9.	CKS-092	Plug				
	10.		Case				

10. ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10^1*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10^3*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effeictive digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10^1*		*RN1/4SR 5 6 2 1 F*

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Fig. 17

FM Front End (CWB-172)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		CWW-173
★★	IC2		PA4009
★★	*Q1		P003
★★	Q2		2SC2570
★★	Q3		2SK241-GR
★	D1 – D3		KV1310-6
	L1	Coil	CTC-189
	L2	Coil	CTC-190
	L3	Coil	CTC-191
	L4	Chip Inductor	CTF-185
	L5	Chip Inductor	CTF-186
	T1	Transformer	CTC-186
	T2	IF Transformer	CTC-187
	TC1, TC2	Trimmer	CCG-098
	CF1, CF2	Ceramic Filter	CTF-182

RESISTORS

Mark	Symbol & Description	Part No.
	R1, R2, R4 – R11, R14 Chip Resistor	RS1/8S □□□J
	*R3, R12, R13	RD1/6PS □□□J

Caution:
Transistor *Q1 and resistor *R3 used mutually in the following assembly.

Q1	R3
P003-A	RD1/6PS473J
P003-B	RD1/6PS393J

CAPACITORS

Mark	Symbol & Description		Part No.
	C1, C2	Chip Capacitor	CCSSH220J50
	C3, C8	Chip Capacitor	CCSCH050C50
	C4, C5, C11, C15, C20	Chip Capacitor	CKSYB222K50
	C6	Chip Capacitor	CCSCH040C50
	C7, C10	Chip Capacitor	CKSYB103K50
	C9	Chip Capacitor	CCSSH560J50
	C12, C18	Chip Capacitor	CCSTH150J50
	C13	Chip Capacitor	CCSTH330J50
	C14	Chip Capacitor	CCSTH120J50
	C16, C19, C21	Chip Capacitor	CKSYF223Z50
	C17	Chip Capacitor	CCSUJ080D50
	C22		CEA2R2M35LS
	C23		CEA3R3M25LS

Tuner P.C. Board (FX-T8SDK/WG)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		PA0013
★★	IC2		PA0014
★★	IC3		PA0015
★★	IC4		PA2014
★★	IC5		HA12434
★★	IC6		MN6147
★★	IC7		PD4046A
★★	IC8		AN6540
★★	IC9		S0280
★★	IC10		TA75558P
★★	IC11		S551
★★	Q1, Q18, Q25		2SA1048
★★	Q2 – Q5, Q8, Q9, Q11, Q12, Q15, Q16, Q19, Q21, Q24, Q26 – Q31, Q33 – Q35, Q40 – Q44		2SC1740S or 2SC2458
★★	Q6, Q7		2SD1012
★★	Q10		2SK163
★★	Q13, Q14, Q32		2SB562
★★	Q17		2SC1675
★★	Q20		2SK330-Y
★★	Q22		2SD667
★★	Q23		2SB772
★	D1, D31, D36, D37		US1040 or BS442
★	D2 – D7, D10, D11, D14 – D19, D22, D24 – D28, D32 – D35		1S2473VH
★	D8		1S1555
★	D9		KV1235Z5 or KV1235Z3
★	D12, D20		MTZ5.6B or RD5R6EB2 or HZ6B1
★	D13		HZ3C2 or RD3R3EB1
★	D21		MTZ5.1C or RD5R1EB3 or HZ5C3
	L1, L5	Ferri-Inductor	CTF-156
	L2	Ferri-Inductor	CTF-155
	L3	Coil	CTC-144
	L4	Ferri-Inductor	CTF-157
	L6		CTX-022
	T1	Coil	CTC-193
	T2	Coil	CTC-194
	T3	Coil	CTB-149
	T4	Coil	CTB-161
	T5, T6	Coil	CTB-150
	T7	Coil	CTB-164
	T8	Coil	CTE-139
	T9	Coil	CTE-140
	T10, T11	Coil	CTB-151
	T12	Coil	CTB-165
	T13, T14	Coil	CTF-125
	CF1	Ceramic Filter	CTF-182

Mark	Symbol & Description		Part No.
	CF2	Filter	CTF-100
	CF3	Filter	CTF-165
	CF4	Ceramic Resonator	CTF-109
	CR1		CWW-183
	CR2		CWW-182
**	VR1	Semi-fixed, 22kΩ (B)	CCP-247
**	VR2	Semi-fixed, 1.5kΩ (B)	CCP-240
**	VR3, VR5	Semi-fixed, 4.7kΩ (B)	CCP-243
**	VR4	Semi-fixed, 1kΩ (B)	CCP-239
	X1	X'tal	CSS-034

RESISTORS

Mark	Symbol & Description	Part No.
	R1, R3, R4, R6 – R16, R19 – R22, R24, R26 – R38, R41 – R43, R46 – R51, R53, R54, R56 – R102, R104, R106 – R116, R124, R125, R127 – R129, R131 – R136,	RS1/8S □□□J
	R138 – R147, R201 – R211 Chip Resistor	
	R2, R17, R18, R23, R25, R52, R55, R103, R126, R130	RD1/4PM □□□J
	R44, R105, R137	RD1/4VM □□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C46, C62, C67, C74, C89, C122 Chip Capacitor	CKSYF104Z25
	C2 Chip Capacitor	CCSCH470J50
	C3, C10, C30, C31, C72, C88, C91, C117	CEA010M50L2
	C4, C17, C36, C83, C90, C120	CEA100M16L2
	C5, C6, C8, C9, C39, C43, C49, C59, C68, C69 Chip Capacitor	CKSYB223K25
	C7, C40, C41, C48, C51, C52, C60, C71, C84 Chip Capacitor	CKSYF473Z50
	C11, C42, C61, C70, C78, C92, C93, C108, C113 Chip Capacitor	CKSYB103K50
	C12, C73 Chip Capacitor	CCSSL101J50
	C13, C33, C34	CEA2R2M50L2
	C14	CEA4R7M50NPLL
	C15, C56, C75, C76, C115	CEA220M16L2
	C16 Chip Capacitor	CKSYB102K50
	C18, C53, C81	CEA470M16L2
	C19, C35, C119	CQMA103J50L
	C20	CQMA822J50L
	C21, C22 Chip Capacitor	CKSYB682K50
	C23	CQMA183J50L
	C24	CSZA010K25
	C25	CSZA1R5M25
	C26	CSZA2R2M25
	C27, C104, C105	CQSAH102J50
	C28, C29, C77	CEA010M50NPLL
	C32	CEA471M10L2
	C37, C38	CEA4R7M25L2
	C44	CKSYB332K50
	C45	CSZA100M10
	C47, C50 Chip Capacitor	CCSSH120J50
	C54	CEAR47M50L2
	C55, C58, C114	CEAR33M50L2
	C57	CEA3R3M50LS
	C63	CEA221M10L2
	C64	CCDRH430J50
	C65, C107, C109 Chip Capacitor	CCSCH680J50
	C66	CCDVK150J50L
	C79, C80	CCSCH100D50
	C82, C94 Chip Capacitor	CCSCH330J50
	C85, C112, C121 Chip Capacitor	CKSYB223K25
	C86	CEA471M16L2
	C87	CEA101M10L2
	C95	CQPA331G100
	C96, C98, C100 – C102	CKSYF473Z50
	C97	CCDSH430J50
	C99, C111	CEA0R1M50L2
	C106	CCDCH120J50
	C110 Chip Capacitor	CCSSL331J50
	C116	CQSA151J50
	C118	CQMA333J50L
	C123 – C126 Chip Capacitor	CCSSL471J50

Tuner P.C. Board (FX-T8/EW)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
**	IC1	PA0013
**	IC2	PA0014
**	IC3	PA0015
**	IC4	PA2014
**	IC5	HA12434
**	IC6	MN6147
**	IC7	PD4046A
**	IC8	AN6540
**	Q1, Q18, Q25	2SA1048
**	Q2 – Q5, Q8, Q9, Q11, Q12, Q15, Q16, Q19, Q21, Q24 Q26 – Q31, Q33 – Q37	2SC1740S or 2SC2458
**	Q6, Q7	2SD1012
**	Q10	2SK163
**	Q13, Q14, Q32	2SB562
**	Q17	2SC1675
**	Q20	2SK330-Y
**	Q22	2SD667
**	Q23	2SB772
*	D1	US1040 or BS442

Mark	Symbol & Description		Part No.
★	D2 – D7, D10, D11, D14 – D19, D22, D24 – D28		1S2473VH
★	D8		1S1555
★	D9		KV1235Z5 or KV1235Z3
★	D12, D20		MTZ5.6B or RD5R6EB2 or HZ6B1
★	D13		HZ3C2 or RD3R3EB1
★	D21		MTZ5.1C or RD5R1EB3 or HZ5C3
★	D29		US1040 or BS442
	L1, L5	Ferri-Inductor	CTF-156
	L2	Ferri-Inductor	CTF-155
	L3	Coil	CTC-144
	L4	Ferri-Inductor	CTF-157
	L6		CTX-022
	T1	Coil	CTC-193
	T2	Coil	CTC-194
	T3	Coil	CTB-149
	T4	Coil	CTB-161
	T5, T6	Coil	CTB-150
	T7	Coil	CTB-164
	T8	Coil	CTE-139
	T9	Coil	CTE-140
	T10, T11	Coil	CTB-151
	T12	Coil	CTB-165
	CF1	Ceramic Filter	CTF-182
	CF2	Filter	CTF-100
	CF3	Filter	CTF-165
	CR1		CWW-183
	CR2		CWW-182
★★	VR1	Semi-fixed, 22kΩ (B)	CCP-247
★★	VR2	Semi-fixed, 1.5kΩ (B)	CCP-240
★★	VR3	Semi-fixed, 4.7kΩ (B)	CCP-243
★★	VR4	Semi-fixed, 1kΩ (B)	CCP-239
	X1	X'tal	CSS-034

RESISTORS

Mark	Symbol & Description	Part No.
	R1, R3, R4, R6 – R16, R19 – R22, R24, R26 – R43, R46 – R51, R53, R54, R56 – R102, R104, R106 – R116, R121 – R123, R201 – R208 Chip Resistor	RS1/8S □□□J
	R2, R17, R18, R23, R25, R52, R55, R103	RD1/4PM □□□J
	R44, R105	RD1/4VM □□□J

CAPACITORS

Mark	Symbol & Description		Part No.
	C1, C46, C62, C67, C74, C89	Chip Capacitor	CKSYF104Z25
	C2	Chip Capacitor	CCSCH470J50
	C3, C10, C30, C31, C72, C88, C91		CEA010M50L2
	C4, C17, C36, C83, C90		CEA100M16L2
	C5, C6, C8, C9, C39, C43, C49, C59, C68, C69	Chip Capacitor	CKSYB223K25
	C7, C40, C41, C48, C51, C52, C60, C71, C84	Chip Capacitor	CKSYF473Z50
	C11, C42, C61, C70, C78, C92, C93	Chip Capacitor	CKSYB103K50
	C12, C73	Chip Capacitor	CCSSL101J50
	C13, C33, C34, C103		CEA2R2M50L2
	C14		CEA4R7M50NPLL
	C15, C56, C75, C76		CEA220M16L2
	C16	Chip Capacitor	CKSYB102K50
	C18, C53, C81		CEA470M16L2
	C19, C35		CQMA103J50L
	C20		CQMA822J50L
	C21, C22	Chip Capacitor	CKSYB682K50
	C23		CQMA183J50L
	C24		CSZA010K25
	C25		CSZA1R5M25
	C26		CSZA2R2M25
	C27		CQSAH102J50
	C28, C29, C77		CEA010M50NPLL
	C32		CEA471M10L2
	C37, C38		CEA4R7M25L2
	C44		CKSYB332K50
	C45		CSZA100M10
	C47, C50	Chip Capacitor	CCSSH120J50
	C54		CEAR47M50L2
	C55, C58		CEAR33M50L2
	C57		CEA3R3M50LS
	C63		CEA221M10L2
	C64		CCDRH430J50
	C65	Chip Capacitor	CCSCH680J50
	C66		CCDVK150J50L
	C79, C80		CCSCH100D50
	C82, C94	Chip Capacitor	CCSCH330J50
	C85	Chip Capacitor	CKSYB223K25
	C86		CEA471M16L2
	C87		CEA101M10L2
	C95		CQPA331G10
	C96, C98, C100 – C102		CKSYF473Z50
	C97		CCDSH430J50
	C99		CEA0R1M50L2
	C123 – C126	Chip Capacitor	CCSSL471J50

11. PACKING METHOD

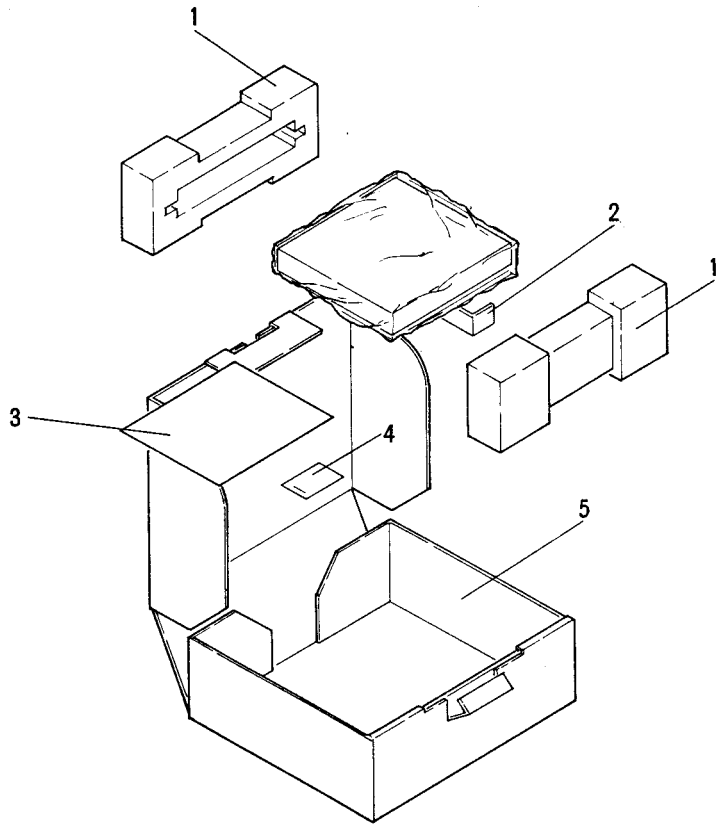


Fig. 18

● Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CHC-900	Styrofoam		4-4.	CBA-102	Screw
	2.	CNB-720	Mounting Bracket		4-5.	CDE-437	Cord
	3.	CRD-469	Owner's Manual (FX-T8SDK/WG) (English, French, German)		4-6.	NF50FMC	Nut
					4-7.	WC40FMC	Washer
					5.	CHD-578	Carton (FX-T8SDK/WG)
		CRD-467	Owner's Manual (FX-T8/EW) (English, French, German, Spanish)			CHD-576	Carton (FX-T8/EW)
		CRD-468	Owner's Manual (FX-T8/EW) (Swedish, Norwegian, Dutch)				
		CNM-667	Fastener				
		CDH-048	Sub Feeder Card				
	4.	CEA-782	Accessory Kit				
	4-1.	BNC50P160FMC	Screw				
	4-2.	B20-223-F	Screw				
	4-3.	CBA-101	Screw				