

Service Manual

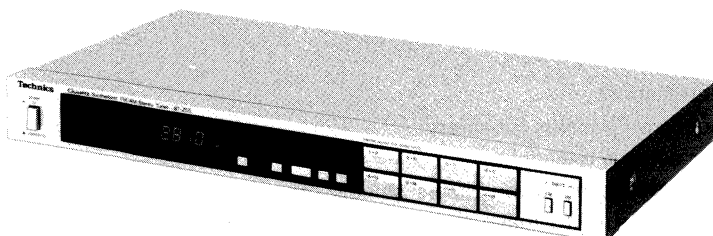
QUARTZ Synthesizer FM/AM Stereo Tuner

ST-Z55

[EGA]

ST-Z55(K)

[EGA]



- * The colors of this model include silver and black.
- * The black type model is provided with (K) in the Service Manual.

Area

* [EGA] is available in F.R. Germany.

TECHNISCHE DATEN

(DIN 45 500)

(Die technischen Daten Können infolge von Verbesserungen ohne An Kündigung geändert werden.)

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz
Eingangsempfindlichkeit	
S/R 30 dB	1,3 μ V (75 Ω)
S/R 26 dB	1,2 μ V (75 Ω)
S/R 20 dB	0,9 μ V (75 Ω)
Nutzempfindlichkeit nach IHF	1,5 μ V (nach IHF '58)
Stereoumschaltswelle bei 46 dB nach IHF	28 μ V/75 Ω
Gesamtklirrfaktor	
Mono	0,1%
Stereo	0,15%
Geräuschabstand	
Mono	70 dB (78 dB nach IHF)
Stereo	65 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+0,5 dB ~ -1,5 dB)
Trennschärfe bei Störsender	
normal $\pm$ 400 kHz	65 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	75 dB
ZF-Dämpfung bei 98 MHz	100 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	100 dB
MW-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	40 dB
Trägerrest	
19 kHz	-60 dB (-60 dB nach IHF)
38 kHz	-60 dB (-60 dB nach IHF)

Kanalabweichung (250 Hz ~ 6300 Hz)	$\pm$ 1,0 dB
Begrenzereinsatz	1,9 μ V
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	522 ~ 1611 kHz (9-kHz-Schritte)
	530 ~ 1620 kHz (10-kHz-Schritte)
Eingangsempfindlichkeit (S/R 20 dB)	20 μ V, 300 μ V/m
Trennschärfe ($\pm$ 9 kHz)	55 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	40 dB
ZF-Dämpfung bei 999 kHz	65 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	1,0 V (IHF)
Leistungsaufnahme	8W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 220V
Abmessungen (B×H×T)	430 × 53 × 245 mm
Gewicht	2,6 kg

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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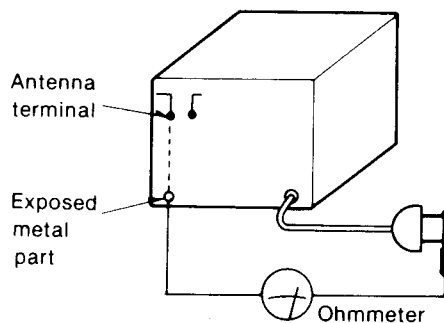
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

● INSULATION RESISTANCE TEST

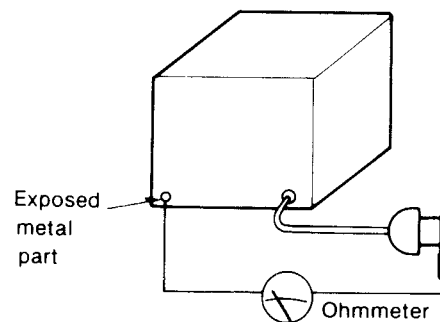
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between $3\text{M}\Omega$ and $5.2\text{M}\Omega$ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = $3\text{M}\Omega$ — $5.2\text{M}\Omega$



(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

Service Manual

QUARTZ Synthesizer FM/AM Stereo Tuner

ST-Z55/ST-Z55(K)

[PC]

Area

- * The colors of this model include silver and black.
- * The black type model is provided with (K) in the Service Manual.

[PC] is available in European Audio Club.

Please use this manual together with the service manual for Model No. ST-Z55(K), Order No. SD83062515C9.

CHANGES

■ REPLACEMENT PARTS LIST

- Notes:**
1. Mentioned in this parts list are only those changed in Model No. ST-Z55(K) for destination [EX] area.
 2. Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
 3. The "S" mark is service standard parts and may differ from production parts.

Ref. No.	Change of Part No.		Area	Part Name & Description	Pcs/Set	Remarks
	ST-Z55/(K) [EX]	ST-Z55/(K) [PC]				
RESISTORS						
R310, 311	ERD25FJ332	ERD25FJ272	[PC]	Carbon, 1/4W, 2.7kΩ, ±5%	2	S
R312, 313	ERD25TJ333	ERD25TJ104	[PC]	Carbon, 1/4W, 100kΩ, ±5%	2	S
CAPACITORS						
C309, 310	ECQM1H153KV	ECQM1H273KV	[PC]	Polyester, 50V, 0.027μF, ±10%	2	
TRANSFORMER						
T701	SLT5K141	SLT5K145	[PC]	Power Source	1	Δ
SWITCH						
S2	——	SSR179	[PC]	Voltage Selector	1	Δ
CABINET and CHASSIS PARTS						
21	SGP3110-1	SGP3130	[PC]	Rear Sub Panel	1	
24	SJA138-3	RJA52Y	[PC]	AC Cord	1	Δ
25	SGPTZ55-SE	SGPTZ55-SX	[PC]	Rear Panel	1	
ACCESSORIES						
A3	——	SJP5213-1	[PC]	Plug Adaptor	1	Δ
A9	SQF11761	SQF11763	[PC]	Instruction Book	1	
PACKING PART						
P3	SPS3495	SPS3495-4	[PC]	Pad, Rear Side	1	

Technics

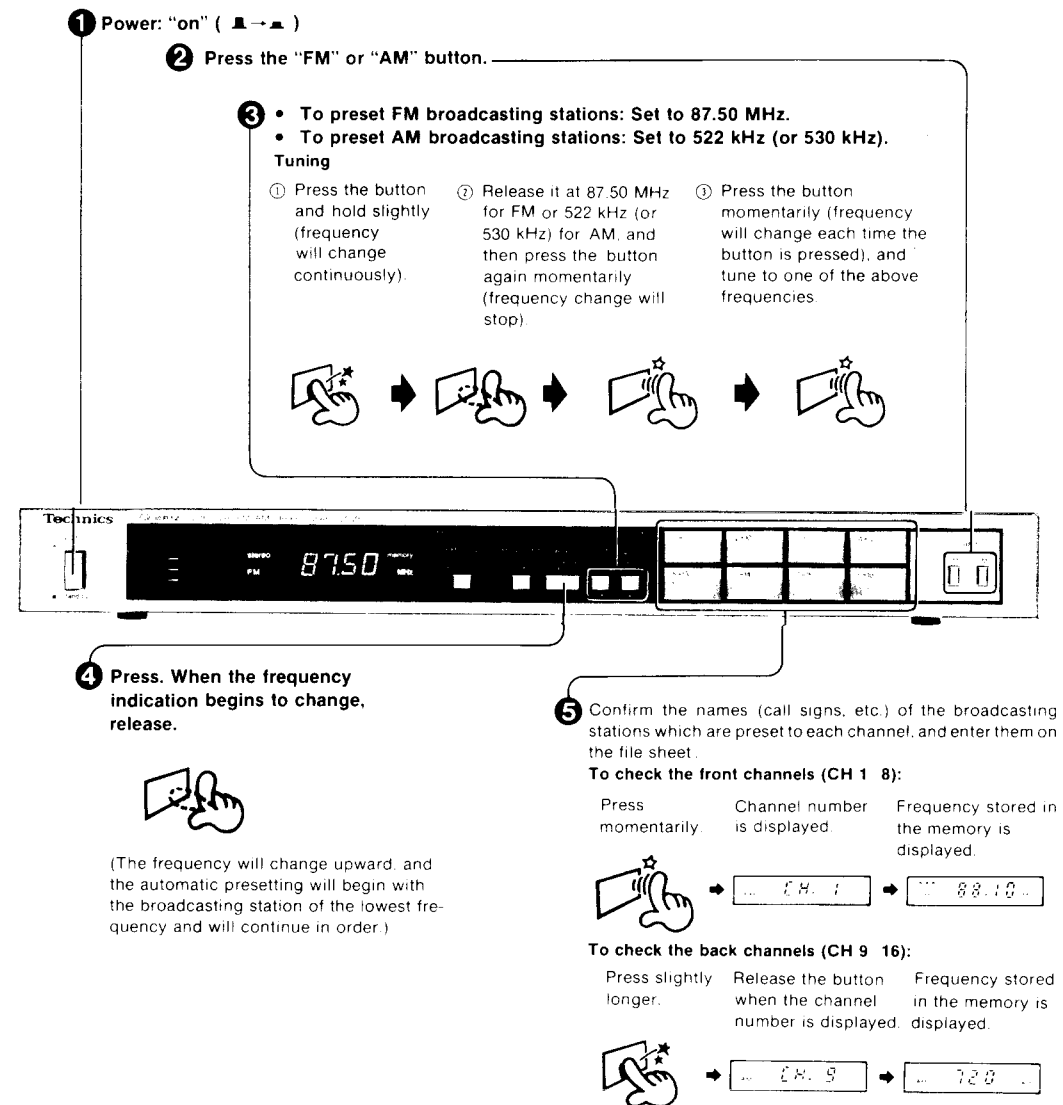
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Printed in Japan
831000500 'H, TN

■ HOW TO OPERATE

• Automatic memory presetting

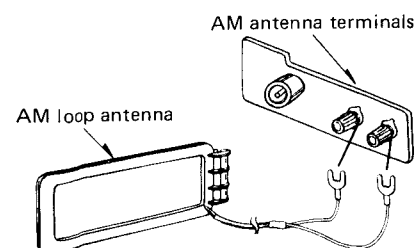
Beginning at the frequency indicated by the digital display, the FM broadcasting stations and AM broadcasting stations will be automatically preset to "channels" 1 through 8 for FM and 9 through 16 for AM, respectively. Note that in mountainous or remote areas, broadcasting stations which have weak broadcasting signals cannot be automatically preset into the memory.



• How to use the AM loop antenna

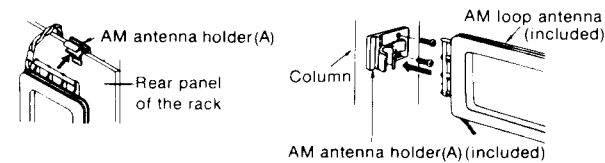
This unit includes a highly sensitive loop antenna for AM broadcast reception. If this antenna is not installed, AM broadcast will not be received. No outdoor antenna is necessary unless this unit is used in an area where signals are especially weak. (Connect the AM loop antenna even when an outdoor antenna is used.)

1. Connect the AM loop antenna to the AM antenna terminals located on the rear panel of the unit.



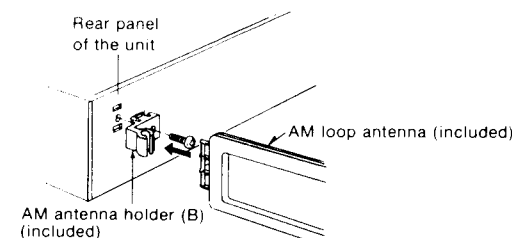
2. Find the height and direction of the antenna where reception is best and then fix it vertically to the wall, rack, etc.

- 1) When attaching the antenna to a wall, column or rack.



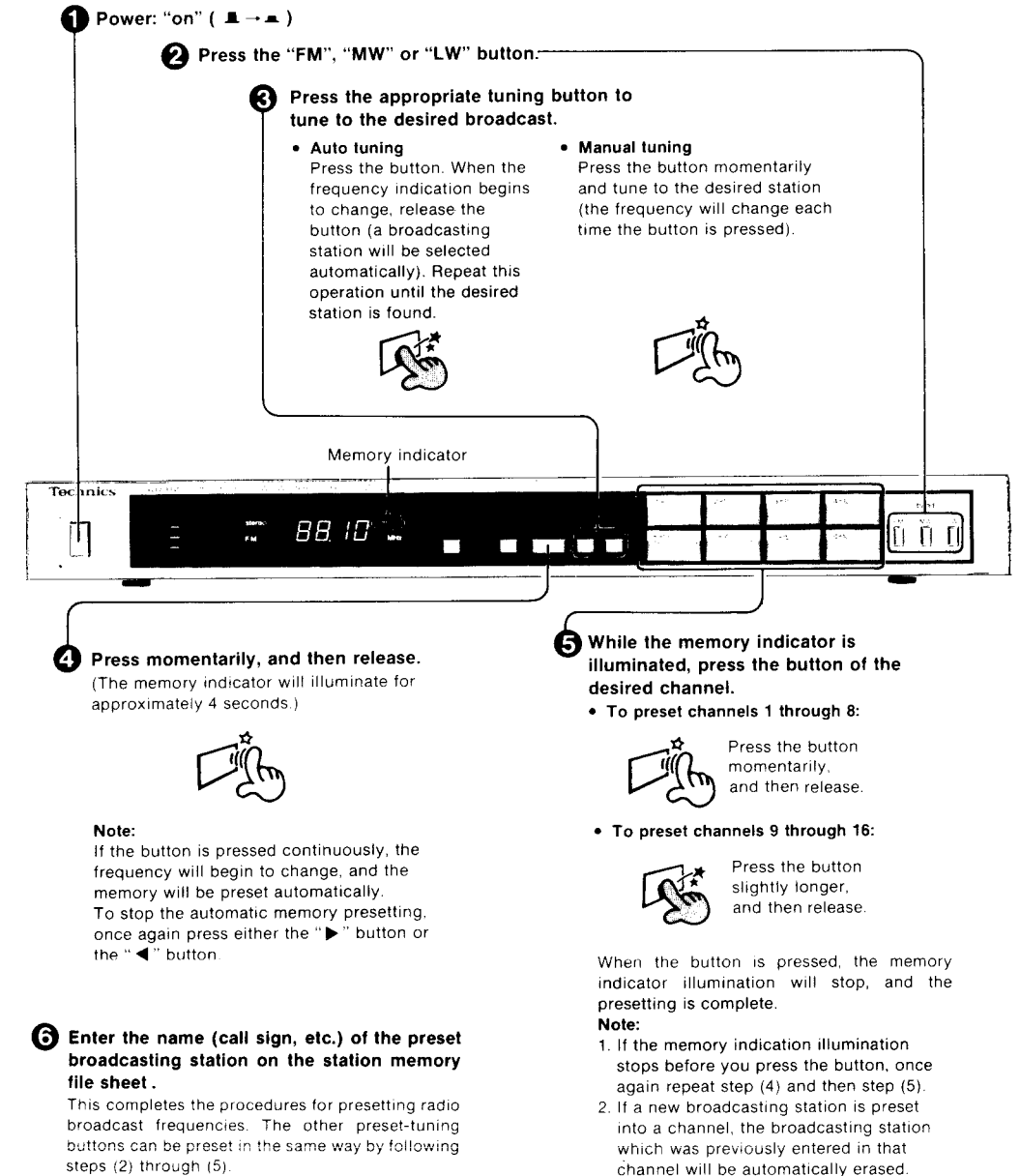
- 2) When attaching the antenna to the unit.

This type of installation may cause impaired reception or result in signal noise. If possible, attach the antenna to the rack, a wall, or a column.



• Manual memory presetting

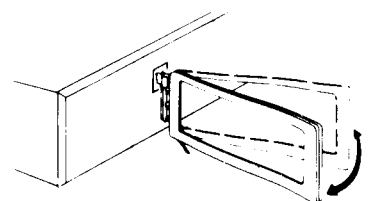
Stations can be freely preset to any desired channel.



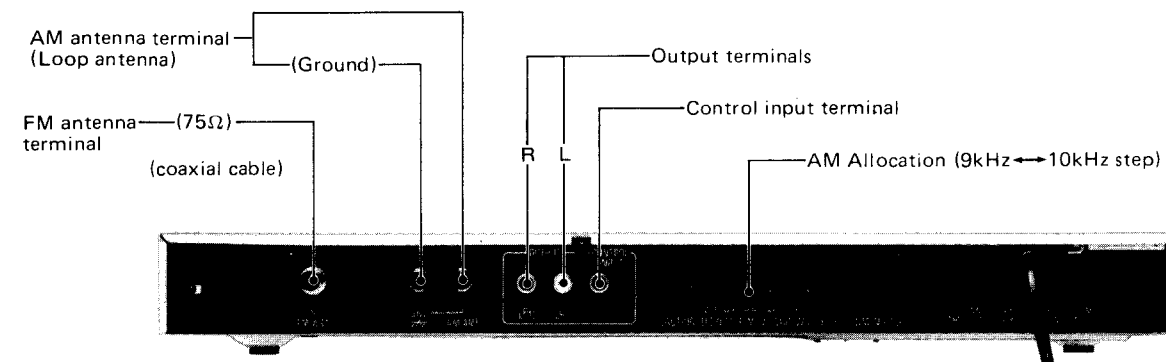
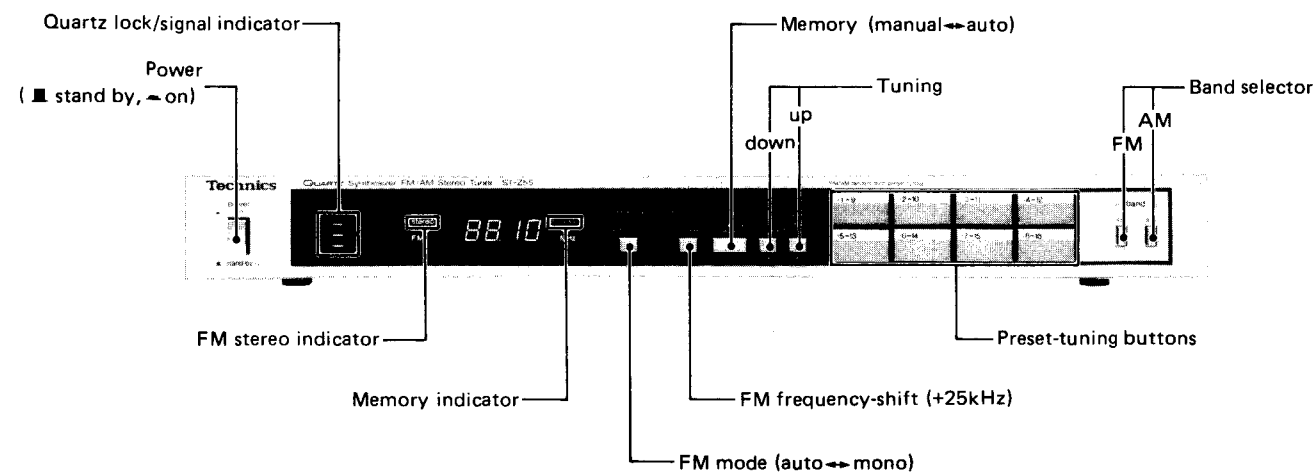
Pay attention to the following points when attaching the antenna.

- 1) Do not attach it horizontally (to do so would impair reception).
- 2) Do not attach it close to metal surfaces (to do so would result in noise).
- 3) Do not attach it close to power cords, speaker wires, etc. (to do so would result in noise).
- 4) Do not attach it close to a tape deck (when the tape deck is being used, chirping or beeping sounds may be received).

3. Move the antenna toward the right or left to find the point of best reception.



LOCATION OF CONTROLS



DISASSEMBLY INSTRUCTIONS

When repairing the FM front-end pack, replace it with the adjusted pack for repair.

How to remove the printed circuit board

1. Remove the 4 setscrews (1 ~ 4 in Fig. 1) of the cabinet.
2. Move the cabinet in the direction of the arrow A in Fig. 1.
3. Remove the 5 setscrews (5 ~ 7 in Fig. 1 and 8, 9 in Fig. 2) of the front panel and the 8 setscrews (10 ~ 14 in Fig. 2 and 15 ~ 18 in Fig. 3) of the printed circuit board or rear panel.
4. Pressing the 2 claws on the right and left sides of front panel in the direction of arrow B (Fig. 4), remove the front panel along with the P.C.B. in the direction of arrow C (Fig. 4).

(Raise the printed circuit board when repairing.)

How to remove the front sub-panel

1. Remove the printed circuit board.
(Refer to "How to remove the printed circuit board".)
2. Remove the set screw (18 in Fig. 4) which fastens the bracket of FL. Next, remove the bracket by pushing it in the direction of arrow D with a screwdriver.
3. The claws projected (at 9 portions) from the front sub-panel are engaged with the front panel. Disengage the claws from by screwdriver or the like to remove the front sub-panel. (See Fig. 5)

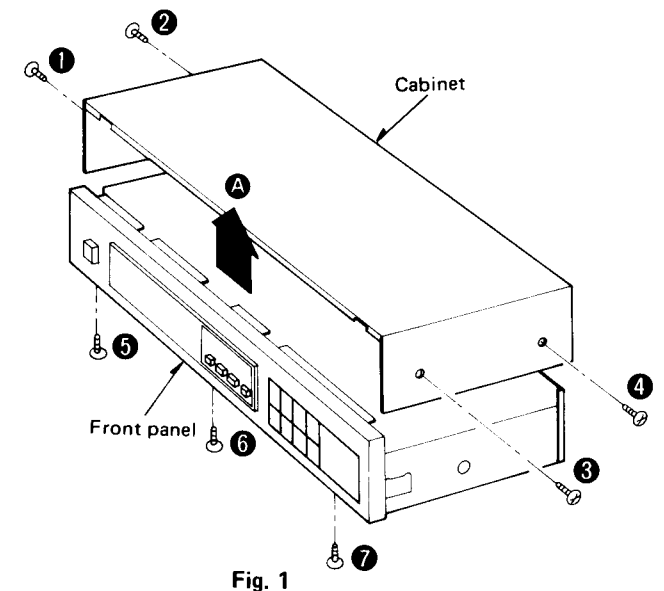


Fig. 1

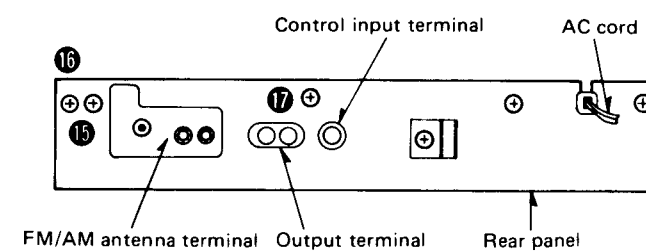


Fig. 3

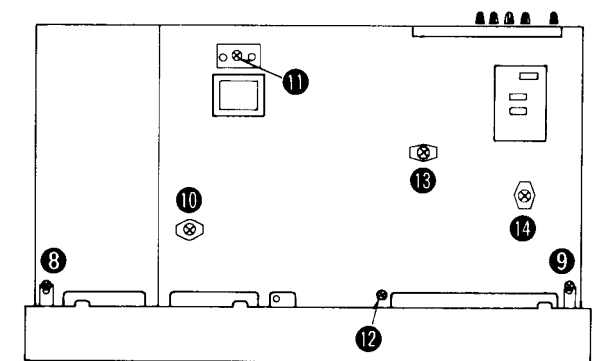


Fig. 2

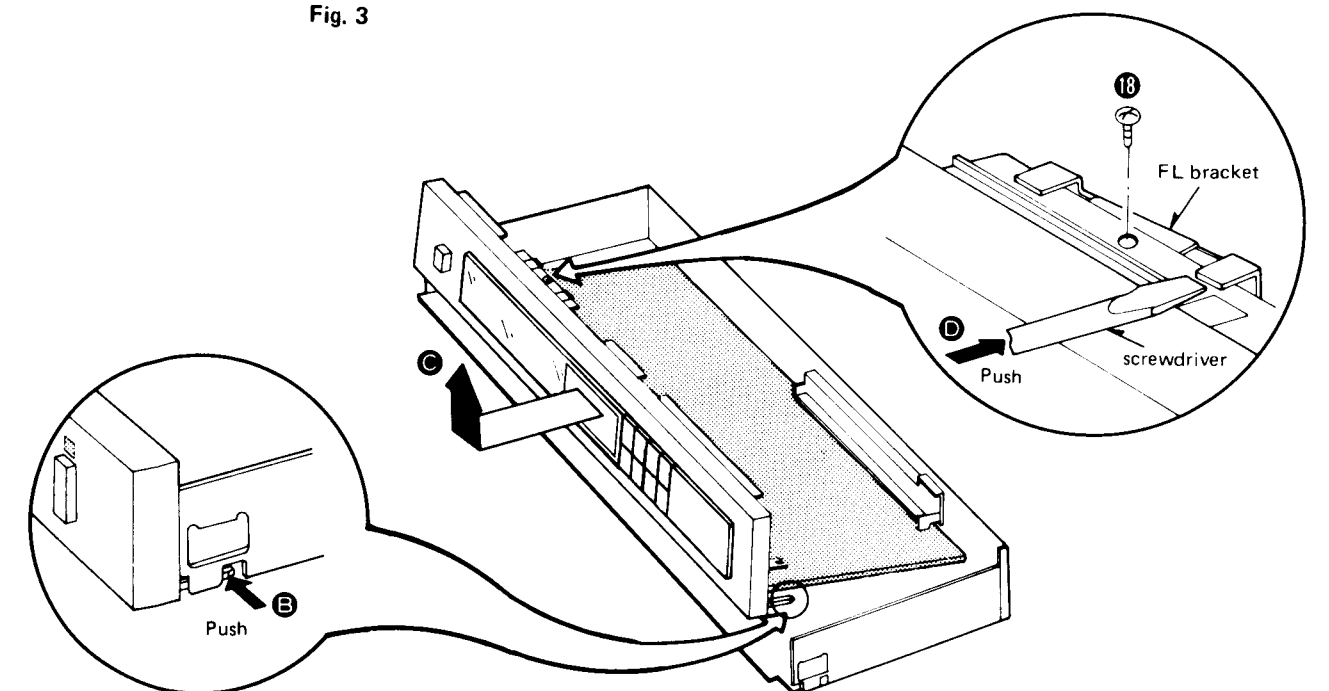
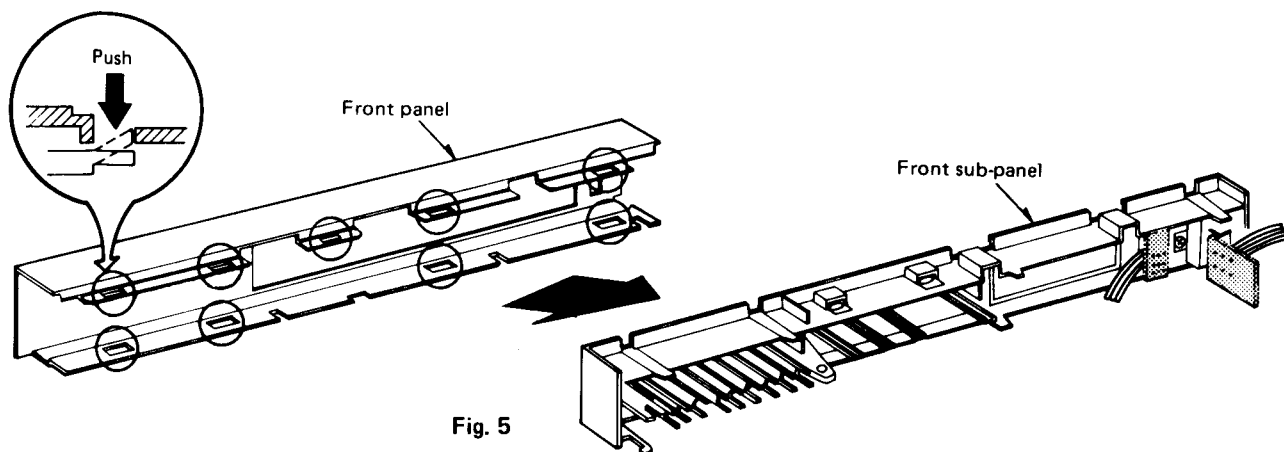


Fig. 4



■ MESSUNGEN UND JUSTIERUNGEN

Anmerkung: Die AM-OSC-Spule (L203) und AM ZFT (T201) sind bereits justiert und benötigt daher keine Justierung.

AM (MW)-EINSTELLUNG

* Stellungen und zu benutzende Geräte						
1. Elektronisches Voltmeter für Wechselstrom (VTVM).			5. Netzspannung auf ihrem Sollwert halten.			
2. AM (MW)-Meßsender (AM-SG).			6. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.			
3. Bereichsschalter.AM			7. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.			
4. AM (MW) Wellenverteilungs-Wahlschalter auf Position "9 kHz" stellen.						
AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverFAHREN	
ANSCHLUSS	FREQUENZ					
Nr.	AM (MW)-HF-ABGLEICH					
1	AM-MO über 200 pF Kondensator an den AM-Antennenanschluß anschließen, wie in Abb. 6 gezeigt. 2 (Schwacher Eingang.)	612 kHz (400 Hz Modul., 30%)	612 kHz	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "OUTPUT" anschließen.	L202 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L202 mit einem Schraubendreher justieren.
		1503 kHz (400 Hz Modul., 30%)			1503 kHz	CT201 (Ant. Trimmer)

FM (UKW)-EINSTELLUNG

* Stellungen und zu benutzenden Geräte			* Vorbereitung des UKW-Meßoszillators (UKW-MO)		
1. UKW-Meßsender (FM-SG)			Die Normal-Eingangsleistung dieses Gerätes beträgt 60 dB		
2. Klirrfaktor-Meßbrücke.			(1 mV), 400 Hz, 100% Modulation. (Wegen der Dämpfung bei		
3. Oszillograph.			Verwendung von Koaxialkabeln, muß die MO-Ausgangsleistung		
4. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM).			6 dB oder mehr betragen: d.h. wenn die Eingangsleistung		
5. Signalfrequenzmesser (meßbar für 19 kHz und 108 MHz)			60 dB beträgt, muß der MO-Ausgang 66 dB betragen.		
6. Bereichsschalter. FM					
7. Den UKW-Betriebsartenschalter auf die "mono"-Position stellen.					
8. Die anderen Einstellungen sind gleich wie beider MW-Justierung.					
FM (UKW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverfahren
ANSCHLUSS	FREQUENZ				
UKW-HF-ABGLEICH					
3	UKW-MO an FM Antennende anschließen. (Schwacher)	100.10 MHz (400 Hz Modulat., 100%)	100.10 MHz	Wechselstrom-Voltmeter oder Oszillograph über den Ausgang "OUTPUT" anschließen.	T1 (Ant. Spule) Die Eingangsfrequenz und die Einstellungspunkte so justieren, daß der Ausgang den maximalen Wert erreicht.
ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
4	UKW-MO an FM Antennende anschließen, wie in Abb. 7 gezeigt. (60 dB in den Antenneneingang anlegen.)	100,10 MHz (400 Hz Modulat. 100%)	100,10 MHz	Ein Gleichstrom-Voltmeter zwischen TP101 (–) und TP102 (+) über eine Drosselspule anschließen.	T101 (Diskriminator FT) Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Zustand 0 mV im 300 mV Bereich beträgt.
5				Klirrfaktor-Meßbrücke an Ausgangsklemme "OUTPUT" anschließen.	T102 (Diskriminator FT) Kern von T102 für minimale Verzerrung der rechten und linken Kanäle justieren.
UKW-STEREO-DEKODER-ABGLEICH					
UNTER VERWENDUNG EINES ZÄHLERS			ALTERNATIV-MESSMETHODE		
6	1. Unmoduliertes Mono-Signal 100.10 MHz in das Gerät speisen. 2. FM mode-Schalter auf "FM auto" stellen. 3. Zähler über einen Widerstand von 100k Ohm an TP301 anschließen. (Vgl. Abb. 8) 4. VR301 auf 19 kHz ± 30 Hz einstellen.		1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. VR301 so einstellen, bis die Stereolampe aufleuchtet. Schleifer von VR301 sichern, wie in Abb. 9 gezeigt.		
TRENNUNGS-JUSTIERUNG					
7	UKW-MO an FM Antennende anschließen. (60 dB in den Antenneneingang anlegen) (Pilot 10% Mod. Stereo-Signal)	100,10 MHz (1 kHz Modulat., 100%) (L- oder R-Betrieb)	100,10 MHz	Wechselstrom-Voltmeter durch Tiefpassfilter und die "OUTPUT"-Anschlüsse des Gerätes anschließen. (fc = 15kHz – 19kHz)	VR302 (Trennungs) 1. VR302 so justieren daß der R-Ausgang minimal wird, wenn der Stereo-Modulator im L-Zustand (L-Kanal Modulation) ist.

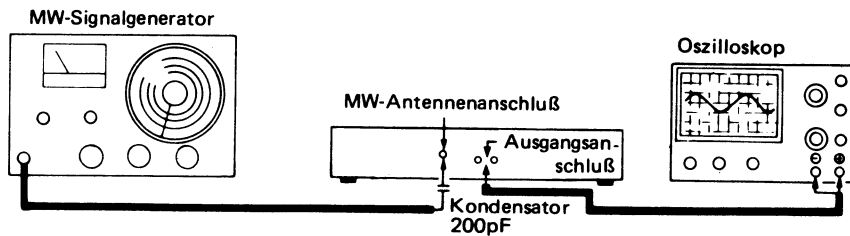


Abb. 6 (MW-Justierung)

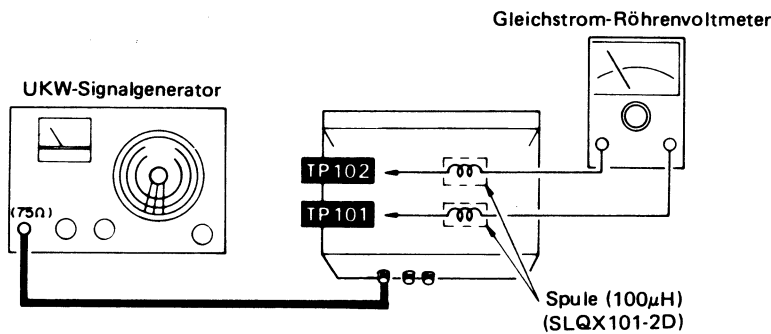
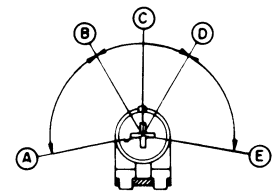


Abb. 7 (Justierung der UKW-Offset)



VR301

- A-B, D-E : Stereo AUS-Position
- B-D : Stereo EIN-Position (Anzeige leuchtet)
- C : Punkt der Pilot-Schaltung justieren.

Abb. 9 (Justierung der UKW-MPX-VCO)

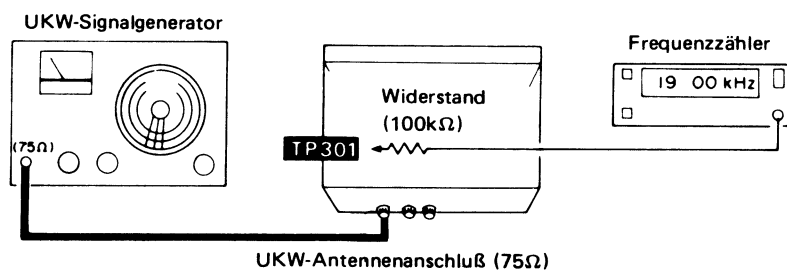
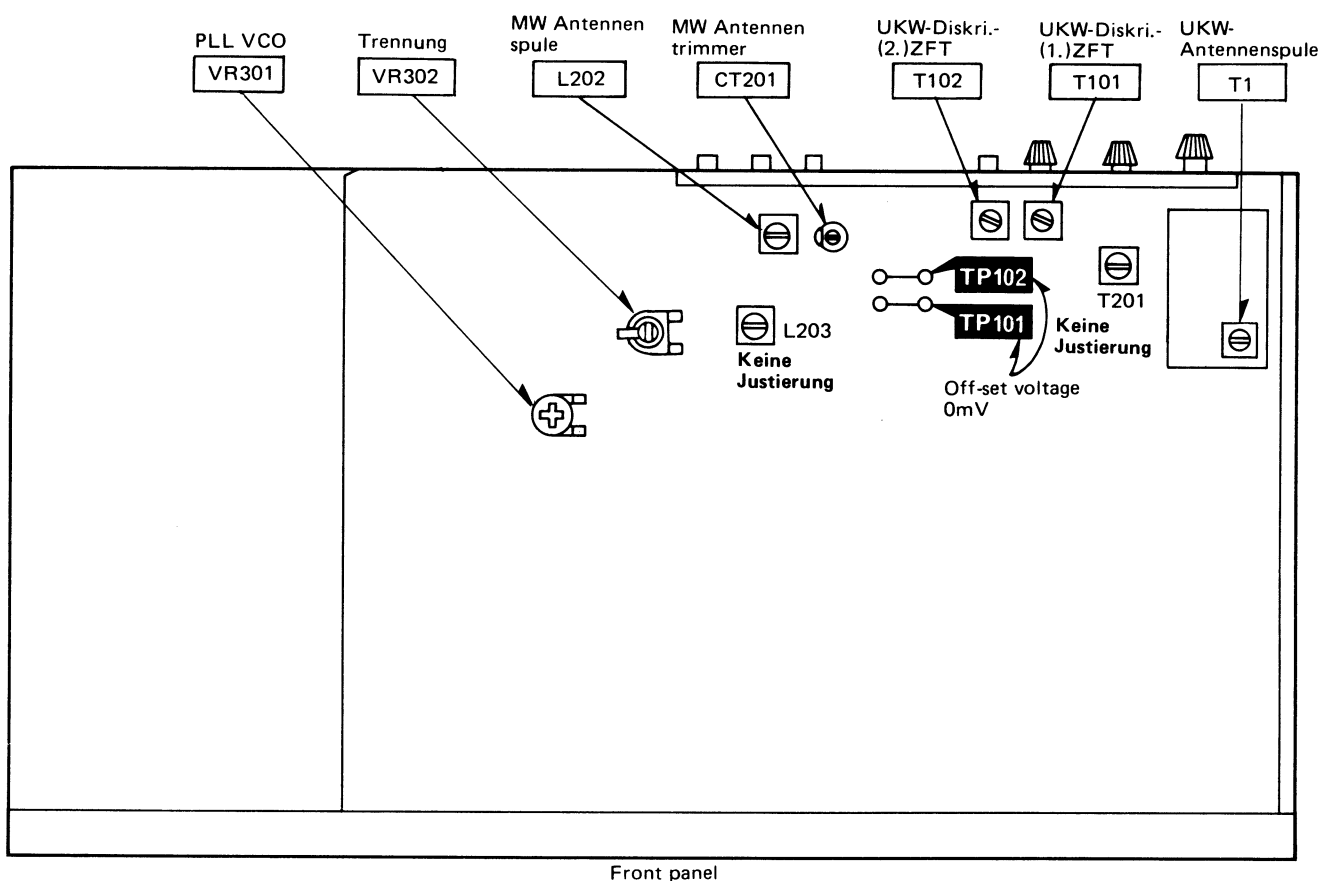
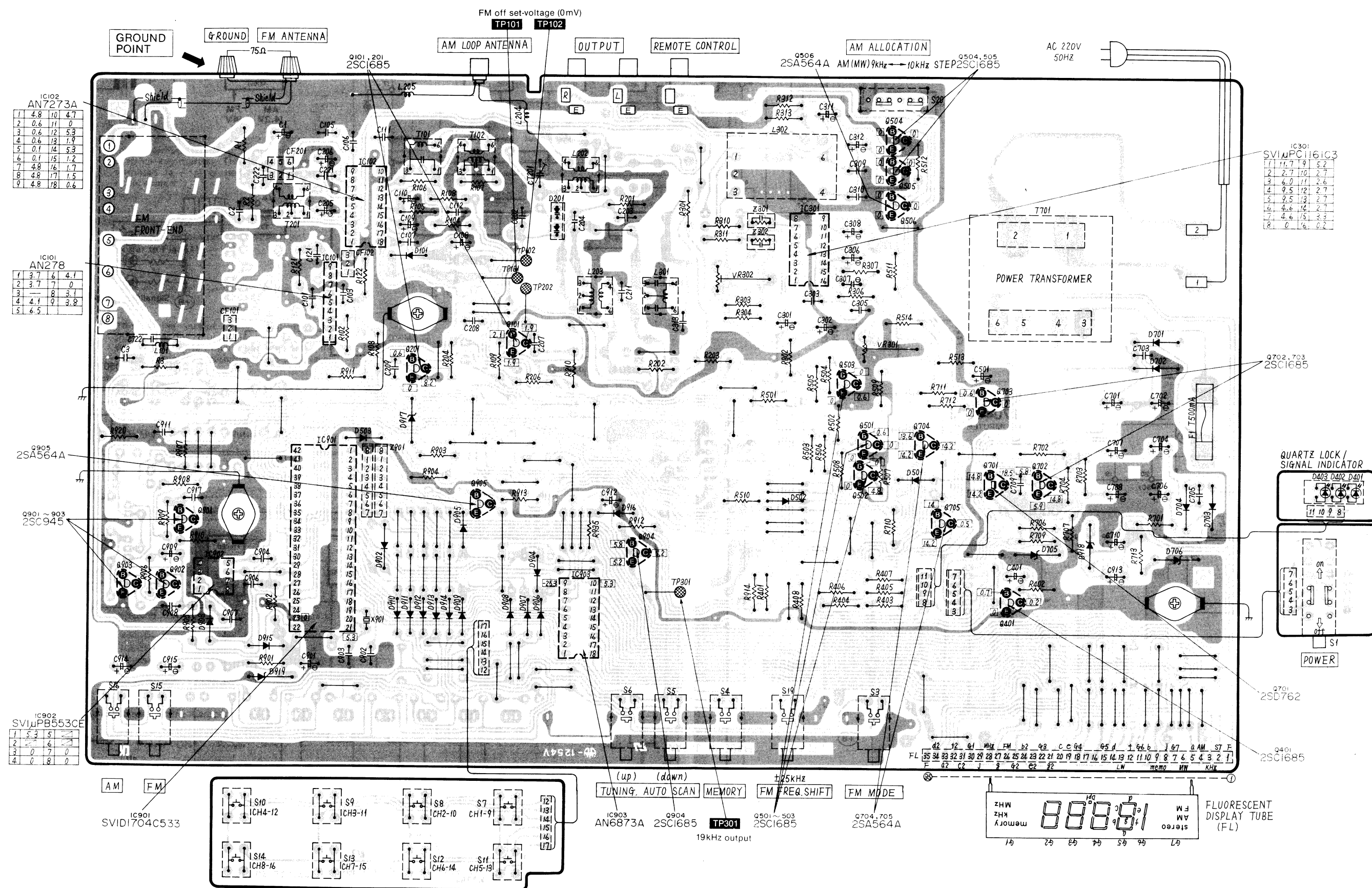


Abb. 8 (Justierung der UKW-MPX-VCO)

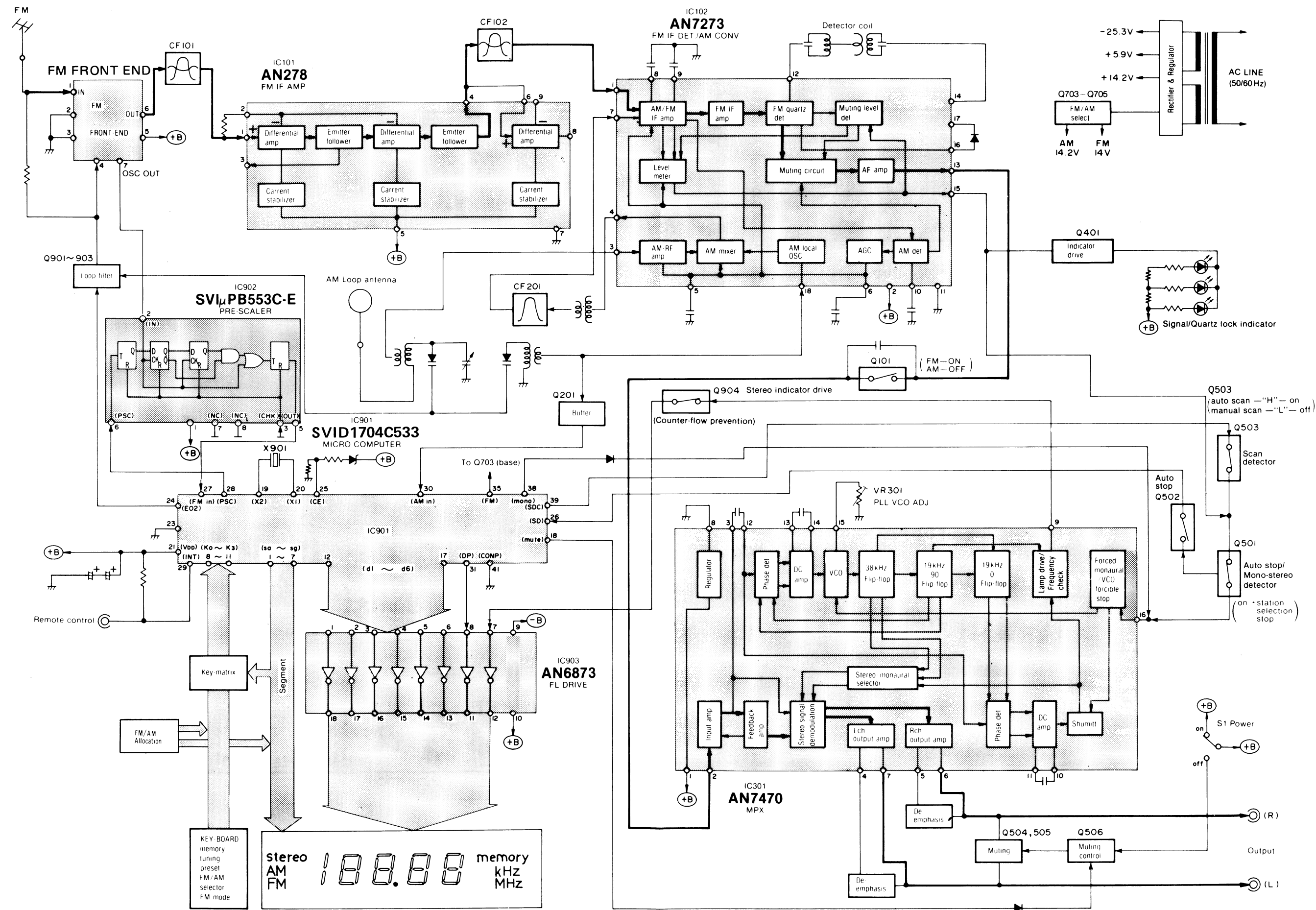


CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines

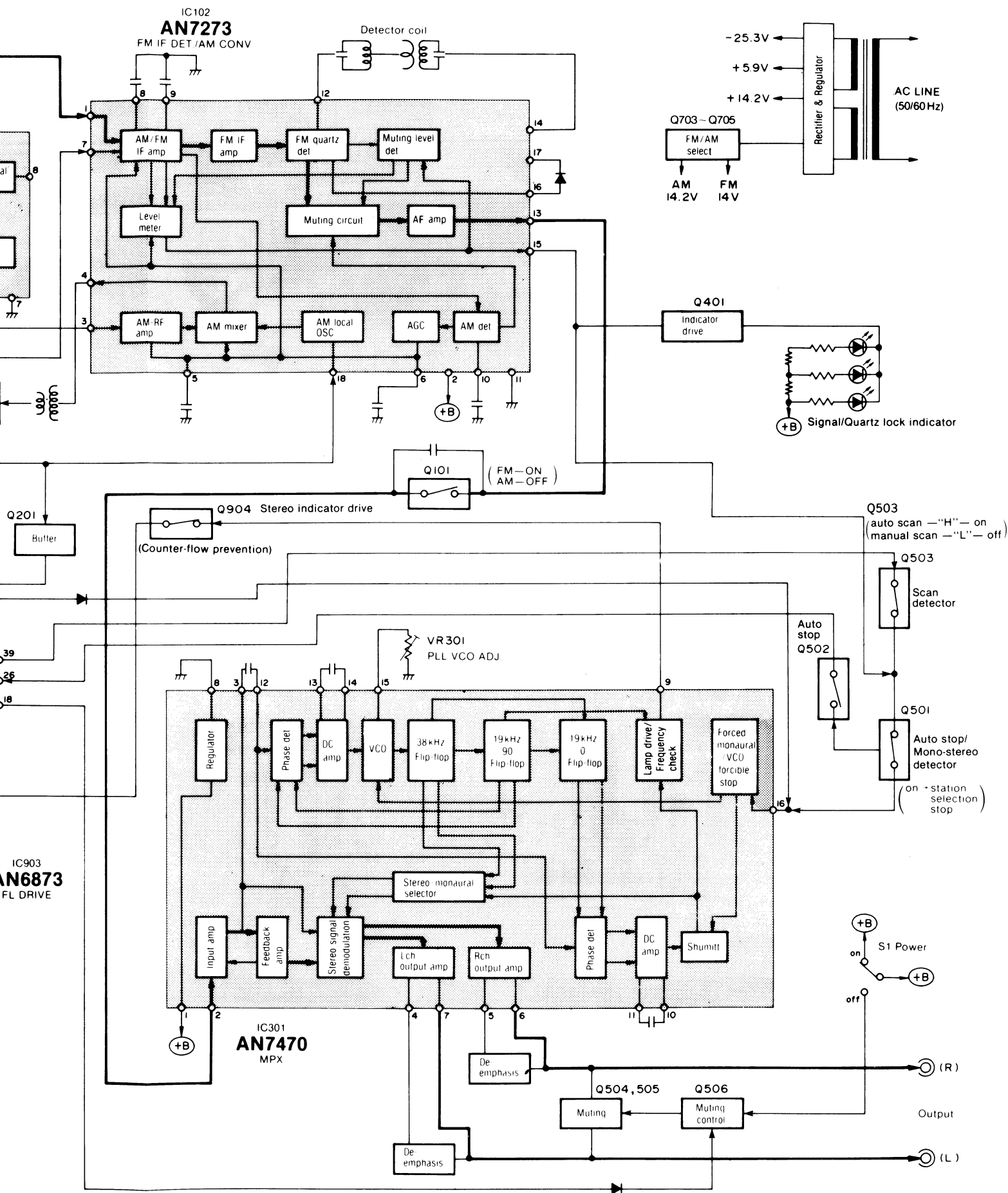


■ BLOCK DIAGRAM



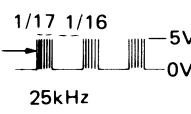
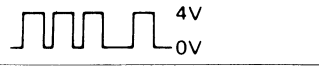
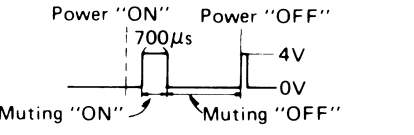
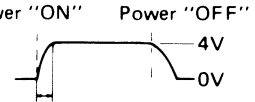
■ FUNCTION

Pin No.	Mark
1	Sa
2	Sb
3	Sc
4	Sd
5	Se
6	Sf
7	Sg
8	K0
9	K1
10	K2
11	K3
12	D6
13	D5
14	D4
15	D3
16	D2
17	D1
18	MT
19	X2
20	X1
21	VDD
22	E01
23	GND
24	E02
25	CE
26	SD
27	FM



13

FUNCTION OF TERMINAL (PLL CONTROLLER IC901)

Pin No.	Mark	Description of terminal	Pin No.	Mark	Description of terminal
1	Sa	Segment signal output terminal for display. (Refer to Fig. 11)	28	PSC	This is the terminal to deliver the frequency dividing ratio changeover output signal to the pre-scaler. The terminal continues to produce pulses at the rise of the signal applied to FM terminal (27) until the content of the inside swallow counter is 0. When the swallow counter comes to 0, the terminal level becomes low, then the frequency dividing ratio of pre-scaler is 1/16. Pulse two times larger than the value that cannot be divided by VCO/16. 
2	Sb		29	INT	
3	Sc		30	AM	Input terminal for AM OSC output. 
4	Sd		31	Dp	
5	Se		32	Lamp	2-bit input/output. Dp (31) is decimal point indication output terminal for digital indication. Lamp (32) is not used in this unit.
6	Sf		33	IF	
7	Sg	Input terminal for key return signal from external key matrix. The output of segment terminals (a ~ g) is used as the key return signal source. 	34	LW	4-bit output port. FM (35) is FM/AM output terminal; 5V in FM and 0V in AM. IF (33), LW (34) and AM (36) not used in this unit.
8	K0		35	FM	
9	K1		36	AM	
10	K2		37	OFF	This is 4-bit input/output port. MONO terminal (38) is the auto/mono changeover output terminal, which is 5V in auto, and 0V in mono. SDC terminal (39) is the auto scan/manual scan changeover output terminal, which is 5V in auto scan, and 0V in manual scan.
11	K3		38	MONO	
12	D6		39	SDC	
13	D5	This is the output terminal to eliminate shock noise due to unlocking at PLL. When the CE terminal is at low level, the output from this terminal is at high level. 	40	D	One-bit input/output port. (Not used in this unit.)
14	D4		41	COMP	
15	D3		42	VDP	One-bit output port. (Not used in this unit.)
16	D2				
17	D1				
18	MT				
19	X2	Connecting terminal for crystal oscillator. The crystal connected is at 4.5 MHz.			
20	X1				
21	VDD	Power supply terminal of the device.			
22	E01	Not used in this unit.			
23	GND	Ground terminal.			
24	E02	When the divided oscillation frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.			
25	CE	This is the selected signal input terminal of the device. When operating the device, make the level high, and when it is not used, make the level low. When this terminal is at low level, all the segment (a ~ g) and digits (D1 ~ D6) terminals are off, but the memory is held.  The device does not operate during this period.			
26	SD				
27	FM	Input terminal for FM OSC output frequency-divided to 1/16 or 1/17 by pre-scaler.			

14

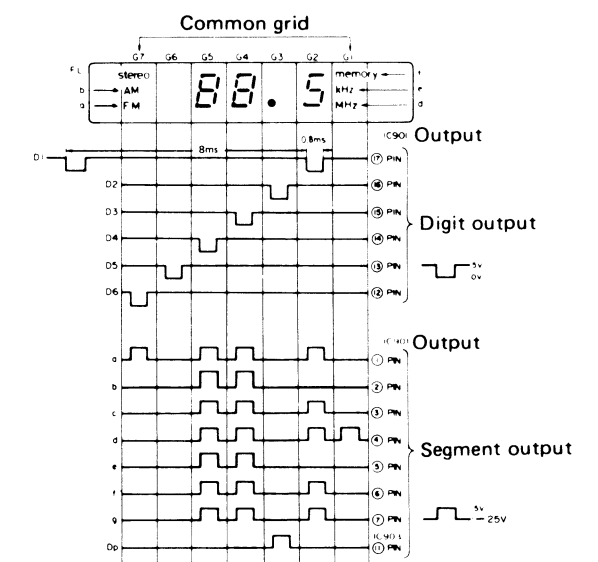
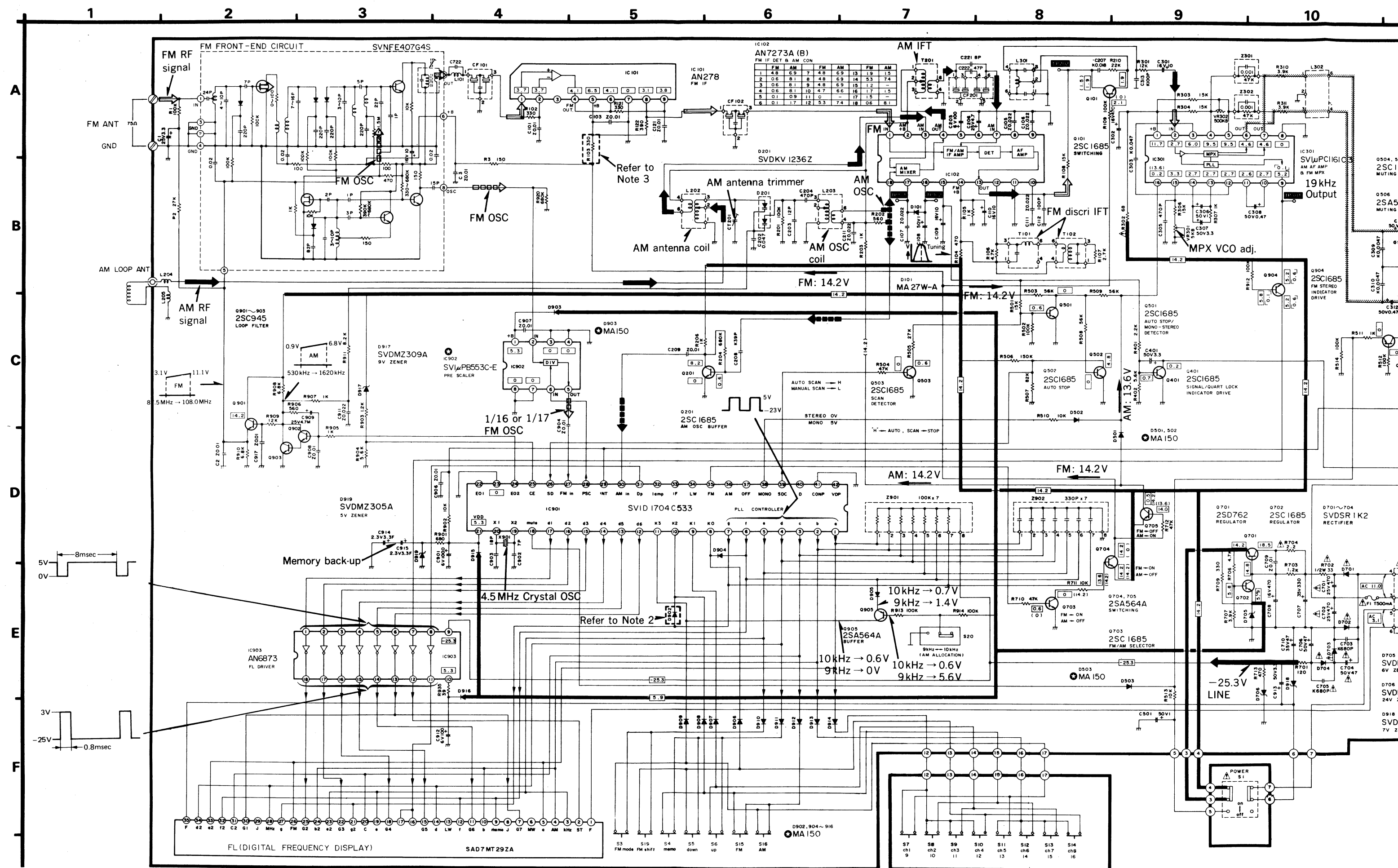
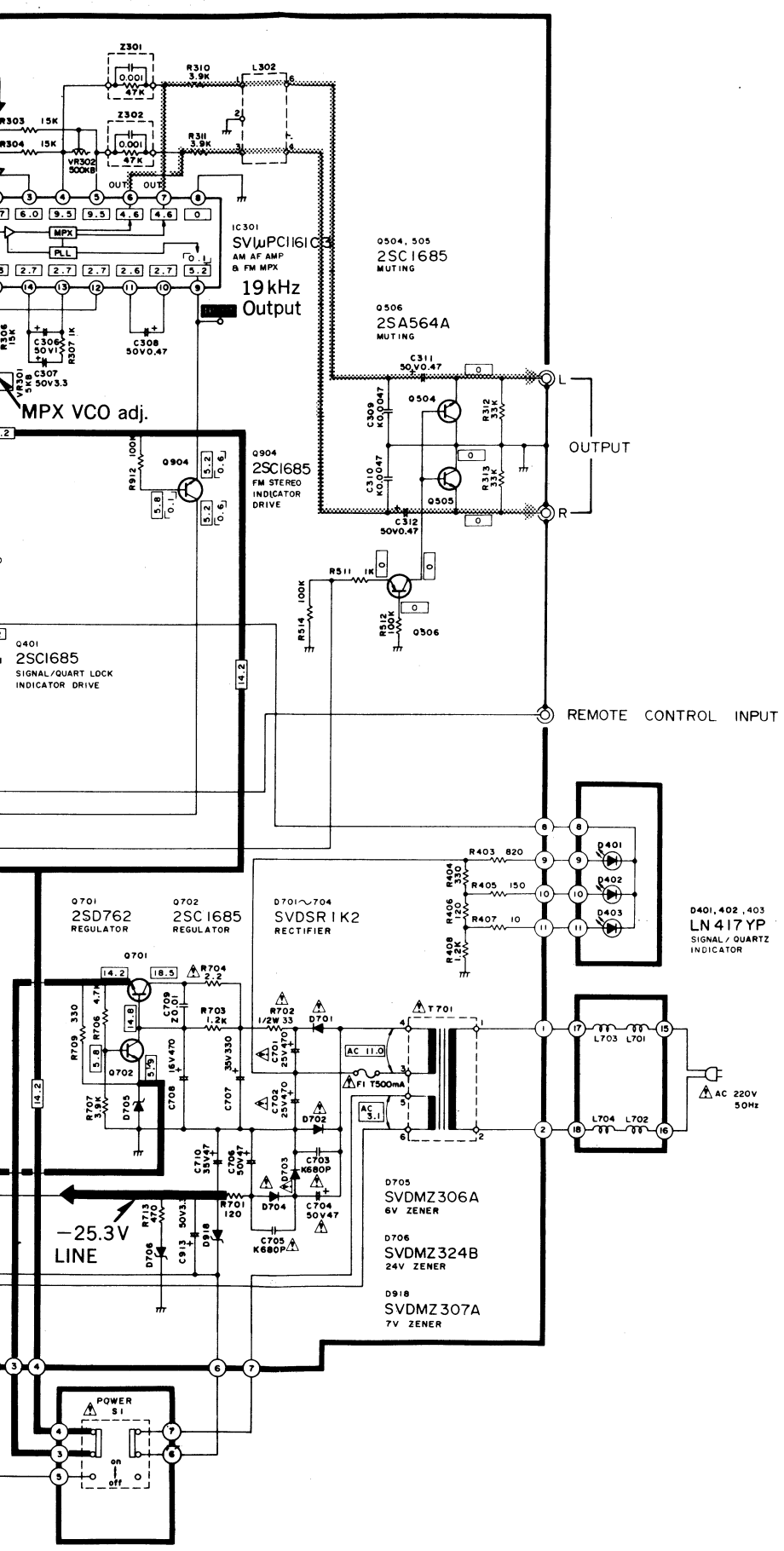


Fig. 11





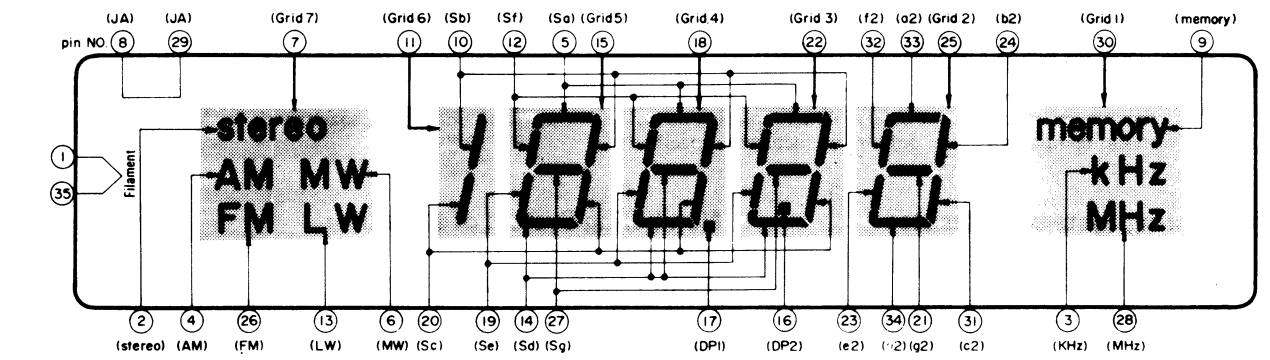
■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.
* This is the basic circuit diagram of this unit.
Note that part of the circuit is subject to change depending on the areas.

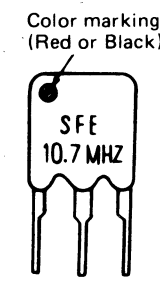
- Note 1:**
- 1. **S1** : Power source switch in "on" position.
 - 2. **S3** : FM mode switch. (auto $\leftrightarrow$ mono)
 - 3. **S4** : Memory set switch. (manual $\leftrightarrow$ auto memory)
 - 4. **S5** : Tuning (down switch. (manual $\leftrightarrow$ auto)
[down : tuning to lower frequency]
 - 5. **S6** : Tuning (up) switch. (manual $\leftrightarrow$ auto)
[up : tuning to higher frequency]
 - 6. **S7 ~ S14** : Preset tuning switch.
* With it lightly pushed (less than 0.4 sec.) and released, the 1 ~ 8 CH (front stations) are received.
* With it continuously pushed (0.4 sec. or more) and released, the 9 ~ 16 CH (back stations) are received.
 - 7. **S15** : FM selector switch.
 - 8. **S16** : AM selector switch.
 - 9. **S19** : FM frequency shift.
 - 10. **S20** : AM allocation switch in "10 kHz step" position.
9 kHz $\leftrightarrow$ 10 kHz step
 - 11. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
* Figures in stand for DC voltage in FM signal (no signal) reception mode.
* Figures in stand for DC voltage in FM stereo signal reception mode.
* Figures in () stand for DC voltage in AM signal reception mode.
 - 12. Positive voltage lines AM signal lines
 FM signal FM IF AM signal AM IF
 - 13. Important safety notice.
Components identified by mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

● Fluorescent Display Tube (FL)



Note 2:

● **Use of ceramic filters in pairs**
The ceramic filters (CF101 and CF102) for FM-IF circuit are available in two ranks. For this machine, be sure to use the ceramics of the same rank in a pair.
At repairing and replacement, pay close attention to the diode (D902) for use as different diodes must be used depending on each rank of the ceramic filters.

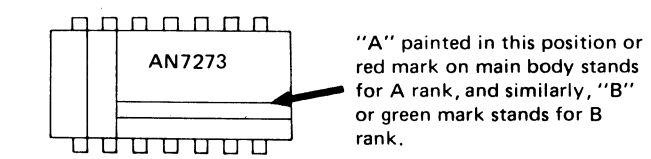


RANK (Color)	D902	CENTER FREQUENCY
Black	○	10.65 MHz
Red	X	10.70 MHz

Note: ○ Mark Diode is used.
X Mark Diode is not used.

Note 3:
AN 7273 (IC102) is available in A rank (AN7273A) and B rank (AN7273B). Either rank can be used for this unit, but the suitable resistor must be used according to the rank as shown in the table below. So, keep this point in mind when repairing or replacing the unit.

RANK Ref. No.	A	B
	1kΩ	560 Ω



● Terminal guide of transistors, IC's and diodes

	<table><tr><td>AN7470</td><td>16 pin</td></tr><tr><td>AN6873N</td><td>18 pin</td></tr><tr><td>AN7273</td><td></td></tr><tr><td>SV1D1704C533</td><td>42 pin</td></tr></table>	AN7470	16 pin	AN6873N	18 pin	AN7273		SV1D1704C533	42 pin	SV1μPB553C-E	2SC1685	2SD762
AN7470	16 pin											
AN6873N	18 pin											
AN7273												
SV1D1704C533	42 pin											
MA150	SVDKV1236Z	MA27W-A	SVDSRIK2	SVDMZ □ □ □ □								
LN03180P LN03480P	AN278											

■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice. Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Numbering System of Resistor

Example	ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value	

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : $\pm 5\%$
ERQ : Fuse Type Metal	1 : 1W	

Numbering System of Capacitor

Example	ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity	
ECEA	50	M	R47	R	
Type	Voltage	Peculiarity use	Value	Special use	

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	QJ : 6.3V	1H : 50V DC	C : $\pm 0.25\mu\text{F}$
ECCD : Ceramic	1A : 10V	2H : 500V DC	J : $\pm 5\%$
ECKD : Ceramic	1C : 16V	2R3 : 2.3V DC	K : $\pm 10\%$
ECQM : Polyester	1E : 25V		Z : $+80\%, -20\%$
ECQP : Polypropylene	1H : 50V		
EECW : Liquid electrolyte double layer capacitor	50 : 50V		
	25 : 25V		

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
RESISTORS											
R1	ERD25TJ104	100K	R505	ERD25TJ273	27K	C1	ECEA50Z3R3	3.3	C309,310	ECQM1H472KV	0.0047
R2	ERD25TJ273	27K	R506	ERD25TJ154	150K	C2,3	ECKD1H103ZF	0.01	C311,312	ECEA50Z47	0.47
R3	ERD25FJ151	150	R507	ERD25TJ823	82K	C4	ECKD1H103ZF	0.01	C313	ECCD1H101K	100P
R102,103	ERD25FJ331	330				C101	ECKD1H103ZF	0.01	C401	ECEA50Z3R3	3.3
R104	ERD25FJ471	470	R508,509	ERD25TJ563	56K	C103	ECKD1H103ZF	0.01	C501	ECEA50Z1	1
R105	ERD25FJ102	1K	R510	ERD25FJ103	10K	C105,106	ECKD1H223ZF	0.022	C701,702	ECEA1ES471	470
R106	ERD25FJ472	4.7K	R511	ERD25FJ102	1K	C107	ECKD1H223ZF	0.022	C703	ECKD2H681KB	680P
R107	ERD25FJ272	2.7K	R512	ERD25TJ104	100K	C108	ECEA50Z1	1	C704	ECEA1HS470	47
R108	ERD25TJ153	15K	R513	ERD25FJ103	10K	C109,110	ECEA1HS100	10	C705	ECKD1H681KB	680P
R109	ERD25TJ104	100K	R514	ERD25TJ104	100K	C111	ECKD1H223ZF	0.022	C706	ECEA1HS470	47
			R701	ERD25FJ121	120				C707	ECEA1VS331	330
R121	ERD25FJ331	330	R702	ERQ12HJ330	33	C112	ECCD1H101K	100P			
R122	ERD25FJ391	390	R703	ERD25FJ122	1.2K	C202	ECQM1H473KV	0.047			
R201	ERD25TJ104	100K	R704	ERD25FJ2R2	2.2	C203	ECCD1H120KC	12P	C708	ECEA1CS471	470
R202	ERD25FJ561	560				C204	ECQP1471JZ	470P	C709	ECKD1H103ZF	0.01
R203	ERD25FJ102	1K	R706	ERD25FJ472	4.7K	C205	ECEA1AS101	100	C710	ECEA1HS470	47
R204	ERD25TJ684	680K	R707	ERD25FJ392	3.9K	C206	ECEA25Z47R	4.7	C722	ECCD1H390K	39P
R206	ERD25FJ102	1K	R709	ERD25FJ331	330	C207	ECQM1H183KV	0.018	C901	ECCD1H070CC	7P
R210	ERD25TJ223	22K	R710	ERD25TJ473	47K	C208	ECCD1H390K	39P	C902	ECCD1H180KC	18P
R301	ERD25TJ123	12K	R711	ERD25FJ103	10K	C209	ECKD1H103ZF	0.01	C903	ECCD1H103ZF	0.01
R302	ERD25FJ680	68	R712	ERD25TJ473	47K	C211	ECKD1H223ZF	0.022	C904	ECKD1H103ZF	0.01
			R713	ERD25FJ471	470				C906,907	ECKD1H103ZF	0.01
R303,304	ERD25TJ153	15K	R901	ERD25FJ681	680	C221	ECCD1H080CC	8P	C908	ECKD1H103ZF	0.01
R306	ERD25TJ153	15K	R902	ERD25FJ103	10K	C222	ECCD1H470K	47P			
R307	ERD25FJ102	1K	R903	ERD25FJ122	1.2K	C301	ECEA1HS100	10	C909	ECEA25M4R7R	4.7
R310,311	ERD25FJ392	3.9K				C302	ECEA1HS471	470	C911	ECKD1H223ZF	0.022
R312,313	ERD25TJ333	33K	R904	ERD25FJ562	5.6K	C303	ECQM1H473KV	0.047	C912	ECEA1AS101	100
R401	ERD25FJ222	2.2K	R905	ERD25FJ102	1K	C305	ECQP1471JZ	470P	C913	ECEA50Z3R3	3.3
R402	ERD25FJ562	5.6K	R906	ERD25FJ561	560	C306	ECEA50Z1	1	C914,915	EECW2R3A3R3	3.3F
R403	ERD25FJ821	820	R907	ERD25FJ102	1K	C307	ECEA50Z3R3	3.3	C917	ECKD1H103ZF	0.01
R404	ERD25FJ331	330	R908	ERD25FJ682	6.8K	C308	ECEA50Z47	0.47			
R405	ERD25FJ151	150	R909	ERD25TJ123	12K						
			R910	ERD25FJ682	6.8K						
R406	ERD25FJ121	120	R911	ERD25FJ822	8.2K						
R407	ERD25FJ100	10	R912	ERD25TJ104	100K						
R408	ERD25FJ122	1.2K	R913,914	ERD25TJ104	100K						
R501	ERD25TJ153	15K									
R502	ERD25TJ104	100K	R920	ERD25TJ684	680K						
R503	ERD25TJ563	56K	R935	ERD25FJ390	39						
R504	ERD25TJ473	47K									

■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. $\odot$ - marked parts are used for black only, while $\circ$ - marked parts are for silver type only.

4. Part other than $\odot$ - and $\circ$ - marked are use for both black and silver type.
5. The "S" mark is service standard parts and may differ from production parts.
6. The parenthesized numbers in the column of description stand for the quantity per set.

Black type model No. ST-Z55 (K)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN278	FM IF Amp.
IC102	AN7273B	FM IF Det & AN Converter
IC301	SUIUPC1161C3	MPX
IC901	SVID1704C533	PLL-Controller
IC902	SUIUPB553AC	Pre-Scaler
IC903	AN6873N	FL Driver
TRANSISTORS		
Q101,201,401,501~505,702,703,904,905,704,705,905	2SC1685-Q	Switching,AM OSC Buffer
Q506,704,705,905	2SA564AR	Regulator
Q701	2SD762-Q	Muting,Switching
Q901~903	2SC945-Q	Regulator Loop Filter
DIODES		
D101	MA27W-A	Rectifier
D201	SVDK1236Z	6V,Zener
D401,402,403	LN417YP	24V,Zener
D501~503,902~916	MA162A	9V,Zener
D701~704	SVDSR1K2	7V,Zener
D705	SVDKM2306A	5V,Zener
D706	SVDKM2324B	
D917	SVDKM2309A	
D918	SVDKM2307A	
D919	SVDKM2305A	
COILS and TRANSFORMERS		
L101,204,205	SLQZ12G1-D	Choke
L202	SLA2C5-P	MW Antenna
L203	SLQ2C29R-P	MW OSC
L301	SLM1C69-P	LPF
L302	SLMA123-Z	LPF
L701,702	SLQZ10G1-D	Choke(RF)
L703,704	SLQX400-D	Choke
T101	SLI4C535-Z	(Power Source)
T102	SLI4C537-Z	FM IFT
T201	SLI2C143-M	FM IFT
T701	SLT5K141	AM IFT
CERAMIC FILTERS		
CF101	SVFE107M22-A	FM,10.7MHz (Red)
	SVFE107M22-D	FM,10.65MHz (Black)
CF102	SVFE107MX2-A	FM,10.7MHz (Red)
	SVFE107MX2-D	FM,10.65MHz (Black)
	(Use pair ranks as same as CF101 and CF102)	
CF201	SVFSFZ450F7L	AM,450kHz
VARIABLE RESISTOR		
VR301	EVN75AA00B53	MPX VCO Adj. 5K Ω (B)
VR302	EVTS3MA00B55	Separation Adj.,500k Ω (B)
VARIABLE CAPACITOR		
CT201	SVCTZ03T110F	MW Antenna Trimmer

Ref. No.	Part No.	Description
VARIABLE COMBINATIONS		
Z301,302	EXRP102K473T	0.001 μF ,47K Ω
Z901	EXBP87104K	100K Ω (X7)
Z902	EXFP7331MW	330pF (X7)
CRYSTAL		
X901	SVQ49U452-T	4.5MHz Counter OSC
FLOURESCENT DISPLAY TUBE		
FL	SAD7MT29ZA	
FM FRONT END		
	SNVFE407G4S	FM RF
FUSE		
F1	XBA2C05TRO	250V,T500mA
SWITCHES		
S1	SSH1049	Power Source
S3~6,15,16,19	SSG11	FM Mode, Memory,Tuning, FM Mode, AM Mode,FM 25kHz Shift
S7~14	SSG13	Preset Tuning
S20	SSS67	AM Allocation
CABINET AND CHASSIS PARTS		
1	SGWTZ55-SE	Front Panel,(Silver)
1	SGWTZ55-KE	Front Panel,(Black)
2	SGUTZ55-SE	Transparent Panel
3	SBC585	Button,Band
4	SBC587	Button,Preset (CH1-9)
5	SBC587-1	Button,Preset (CH2-10)
6	SBC587-2	Button,Preset (CH3-11)
7	SBC587-3	Button,Preset (CH4-12)
8	SBC587-4	Button,Preset (CH5-13)
9	SBC587-5	Button,Preset (CH6-14)
10	SBC587-6	Button,Preset (CH7-15)
11	SBC587-7	Button,Preset (CH8-16)
12	SBC451-4	Button
13	SDU89-1	Filter,FL
14	SBC337-1	Button,Power Switch
15	SGX7527	Front Sub Panel (Silver)
15	SGX7527-1	Front Sub Panel (Black)
16	SUW1893-1	Bracket,Power Switch
17	SUW1891-1	Bracket,FL
18	SKL245-2	Rubber
19	SKCTZ55L-SE	Cabinet (Silver)
19	SKCTZ55L-KE	Cabinet (Black)
20	SJT347	Holder,Fuse
21	SGP3110-1	Rear Sub Panel
22	SHR5181	Spacer
23	SHR127	Bushing,AC Cord

Ref. No.	Part No.	Description
CABINET AND CHASSIS PARTS		
24	SJA138-3	AC Cord
25	SGPTZ55-SG	Rear Panel
25-1	[SKL245-2	Foot
26	SHR5169-2	Spacer,Switch
27	SJF8605N	Terminal Board
28	SUW1959	Bracket
29	SMC1053	Shield Cover
30	RHR110	Bushing
31	SMC1051	Bracket
32	SUS291	Spring,Terminal Board
33	SJE83	Plug,Ass'y
SCREWS		
N1	XTB3+8BFZ	Tapping, $\pm 3 \times 8$
N2	XTN3+8BFN	Tapping, $\pm 3 \times 8$
N3	XSN3+6S	$\pm 3 \times 6$
N4	XTB3+8BFN	Tapping, $\pm 3 \times 8$
N5	XTB3+16BFN	Tapping, $\pm 3 \times 16$
N6	XTBS3+8FFYR1	Tapping with Detent, $\pm 3 \times 8$
N7	SNE2095-2	Tapping(Silver)
N7	SNE2095-3	Tapping(Black)
N8	XTB3+10BFZ	Tapping, $\pm 3 \times 10$
N9	XTB3+6BFZ	Tapping, $\pm 3 \times 6$
N10	XTBS3+8BFZ1	Tapping with Detent, $\pm 3 \times 8$
WASHERS		
N11	XWA3B	Spring, $\phi 3$
N12	XWG3	Plain, $\phi 3$
N13	SHW32E200	
ACCESSORIES		
A1	SJP2249	Cord
A2	SSA901	Cord,FM Indoor Antenna
A3	SSA611-1	Loop Antenna
A4	XTN3+10AFZ	Screw
A5	SMA231	Holder
A6	SMA233-1	Holder
A7	SQF11767	Instruction Book
PACKING PARTS		
P1	SPP697	Polyethylene Bag
P1	SPP659	Polyethylene Bag
P2	SPS3493	Pad,Front Side
P3	SPS3495	Pad,Rear Side
P4	SPG4469	Carton Box
P5	SGK1413	Label(Black only)

EXPLODED VIEW

use for both
and may differ
of description

Description	
RTS	
C Cord	(1)
ear Panel	(1)
oot	(4)
oacer,Switch	(1)
terminal Board	(1)
racket	(1)
ield Cover	(1)
ushing	(1)
racket	(1)
pring,Terminal Board	(1)
ug,Ass'y	(1)
apping,±3×8	(12)
apping,±3×8	(4)
3×6	(2)
apping,±3×8	(1)
apping,±3×16	(1)
apping with Detent, 3×8	(4)
apping(Silver)	(4)
apping(Black)	(4)
apping,±3×10	(2)
apping,±3×6	(3)
apping with Detent, 3×8	(1)
pring, φ 3	(2)
ain, φ 3	(4)
	(1)
ord	(1)
ord,FM Indoor	(1)
enna	(1)
op Antenna	(1)
rew	(2)
older	(1)
older	(1)
struction Book	(1)
lyethylene Bag	(1)
lyethylene Bag	(1)
d,Front Side	(1)
d,Rear Side	(1)
rton Box	(1)
bel(Black only)	(2)

