

Service Manual

Tuner

ST-G70

QUARTZ Synthesizer
AM/FM Stereo Tuner

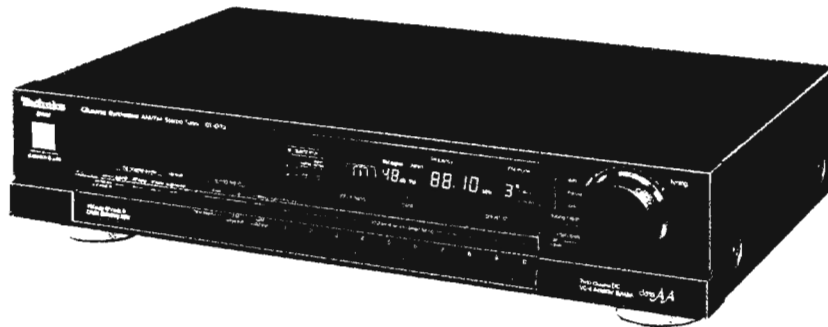
FN8K11A039

Color

(K)...Black Type

Area LV 826647

Color	Area
(K)	(M).....U.S.A.
(K)	(MC).....Canada.



SPECIFICATIONS

(IHF '78)

■ FM TUNER SECTION

Frequency range	87.9 - 107.9 MHz (100 kHz step)
Sensitivity	10.8 dBf (1.9 μ V, 300 Ω , IHF '58)
50 dB quieting sensitivity	
MONO	18.1 dBf (4.4 μ V, 300 Ω , IHF '58)
STEREO	38.1 dBf (44 μ V, 300 Ω , IHF '58)
Total harmonic distortion	0.015% (MONO), 0.02% (STEREO)
S/N	80 dB
Frequency response	4 Hz - 18 kHz, \pm 0.5 dB, -1.5 dB
Alternate channel selectivity	
normal (\pm 400 kHz)	55 dB
super narrow (\pm 200 kHz)	30 dB
Capture ratio	1.0 dB
Image rejection at 98.1 MHz	130 dB
IF rejection at 98.1 MHz	130 dB
Spurious response rejection at 98.1 MHz	130 dB
AM suppression	55 dB
Stereo separation	
1 kHz	60 dB
10 kHz	45 dB
Carrier leak	
19 kHz	-60 dB
Antenna terminals	300 ohms (balanced) 75 ohms (unbalanced)

■ AM TUNER SECTION

Frequency range	530 kHz - 1720 kHz (10 kHz step)
Sensitivity (S/N 20 dB)	20 μ V, 300 μ V/m
Selectivity (\pm 10 kHz)	50 dB
Image rejection at 1000 kHz	40 dB
IF rejection at 1000 kHz	60 dB

■ GENERAL

Output voltage	0.6V
Power consumption	9.5W
Power supply	AC 120V, 60 Hz
Dimensions (W×H×D)	430 × 93.5 × 288 mm (16-15/16" × 3-11/16" × 11-11/32")
Weight	3.5 kg (7.7 lb.)

Notes:

- Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).
- Specifications are subject to change without notice. Weight and dimensions are approximate.

Technics

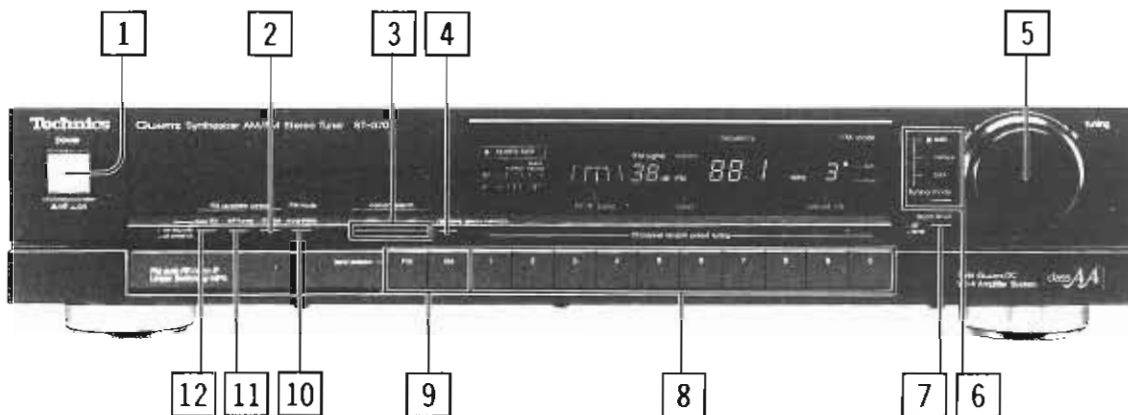
Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Hawaii, Inc.
99-859, Iwaiwa Street
P.O. Box 774
Honolulu, Hawaii 96808-0774

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Ontario, L4W 2T3

Panasonic Sales Company,
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of Puerto Rico, Inc.
Ave. 65 De Infanteria, Km. 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

FRONT PANEL CONTROLS AND FUNCTIONS



Control section

1 Power switch (power)

2 FM IF band selector (IF band)

The built-in computer of this unit detects the signal condition and functions accordingly to select the FM IF band automatically. This button is used to change it manually.

3 Memory-search button (memory search)

This button is used to confirm a memory presetting. If the button is pressed, the memorized frequency and "channel" number will be shown one after the other in order.

4 Memory button (memory)

This button is used when preset memory setting of the preset-tuning buttons is made.

5 Tuning control (tuning)

This control is used to select an FM or AM broadcast. When turning the control to the left, the frequency changes downward. When turning the control to the right, the frequency change upward.

6 Tuning-mode selector/indicator (tuning mode)

Each time this selector is pressed, the selection changes, in sequence, to "auto", "manual" and "lock".

auto:

In this position, broadcast stations are automatically selected when the tuning control is turned to the left or right to start the frequency changing.

manual:

In this position, the tuning control can be used to locate the desired station manually.

lock:

In this position, the broadcast station presently being heard is locked in, and other broadcast stations cannot be tuned to, even if the tuning control is turned.

7 Scan level selector (scan level)

This button is used for setting or confirming the level of the reception signal during automatic FM tuning.

8 Preset-tuning buttons (39 channel random preset tuning)

These buttons are used to preset FM and AM broadcast frequencies into the memory of this unit, and are also pressed to select the desired preset frequencies.

9 Band selectors (band selector)

FM:

Press this button to listen to an FM broadcast.

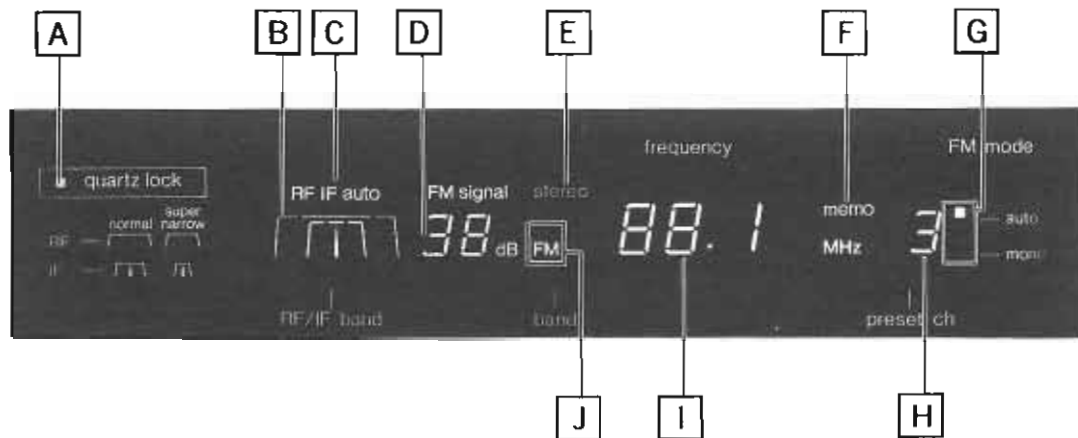
AM:

Press this button to listen to an AM broadcast.

10 FM mode selector (FM mode)

If noise is excessive in stereo broadcasts, a switchover to monaural reception can be made.

When there is a change to monaural reception, the illumination of the FM mode indicator changes to the "mono" position.



11 FM RF-band selector (RF band)

This button can be used to switch the RF bandwidth to either the "normal" width or the "super narrow" width by manual operation.

Interference signals are removed if switched to "super narrow".

12 FM RF-band automatic-selector (auto RF)

Sometimes during the reception of FM broadcasts, that a station other than the desired station is received, or interference noise is excessive. This happens even though there is no broadcast station other than the desired station on a nearby frequency.

The reason for this is that interference signals are produced in a frequency band in which there is actually no broadcast station. When this happens two or more strong broadcast stations' signals (interference signals) are input to the unit's "front end" (input stage). These interference signals are known as "cross modulation" and they cause interference noise to be heard the desired broadcast station.

This model is designed to eliminate such cross modulation interference signals by automatically switching the bandwidth of the RF (radio frequency; high frequency) band to the "super narrow" bandwidth.

- set freq only:

By pressing this selector momentarily, the presence of interference signals within the broadcast signals being received is detected, and there is an automatic switchover to either the "normal" or "super narrow" circuitry as appropriate.

— all preset ch:

If this selector is pressed and held for a few seconds, the presence or not of interference signals within the broadcast signals of all FM broadcast stations that have been preset to the unit's memory is detected. There is then an automatic switchover to either the "normal" or "super narrow" circuitry as appropriate, and then an entry is automatically made (to the memory for these same "channels") for the "normal" or "super narrow" reception condition.

Display section

A Quartz-lock indicator (quartz lock)

This indicator illuminates when tuned precisely to an FM or AM station

B FM RF/IF band indicator (RF/IF band)

These indicators show the FM reception conditions.

C FM RF/IF automatic-select indicator (RF IF auto)

This indicator illuminates when the FM RF-band automatic-selector is pressed.

D FM signal-strength display (FM signal)

This display usually shows the reception level of FM broadcasts (maximum 86 dB); when the scan-level selector is pressed and held, the station-tuning level is displayed in the sequence 30 → 40 → 50.

E FM stereo indicator (stereo)

This indicator automatically illuminates when an FM stereo broadcast is being received.

It will not illuminate if the FM mode selector is set to the monaural mode

F Memory indicator (memo)

This indicator illuminates when the memory button is pressed

G FM mode indicator (FM mode)

When FM broadcasts are being received, usually the "auto" indication is illuminated. When the FM mode selector is used to select monaural reception, the illumination of the FM mode indicator changes to the "mono" position.

H Channel display (preset ch)

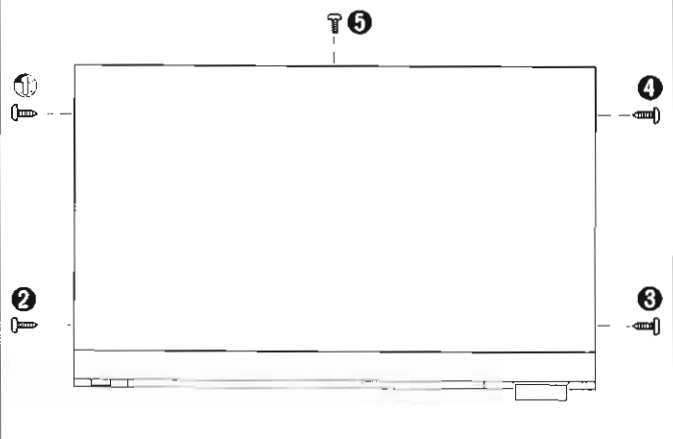
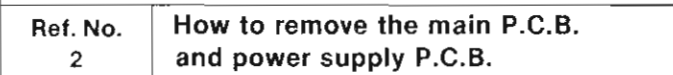

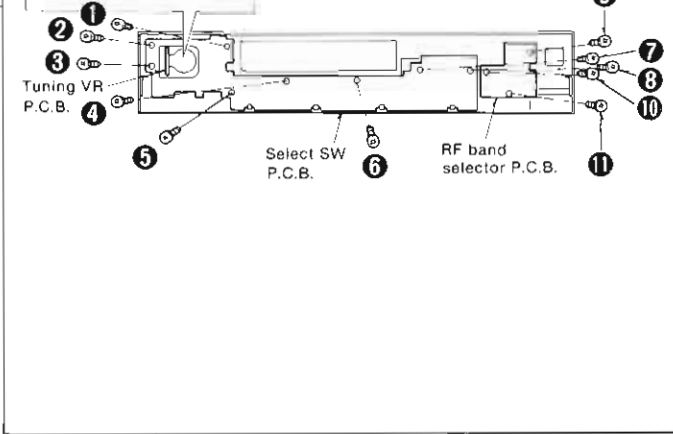
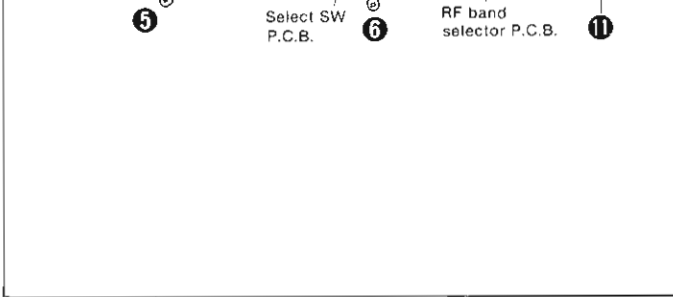
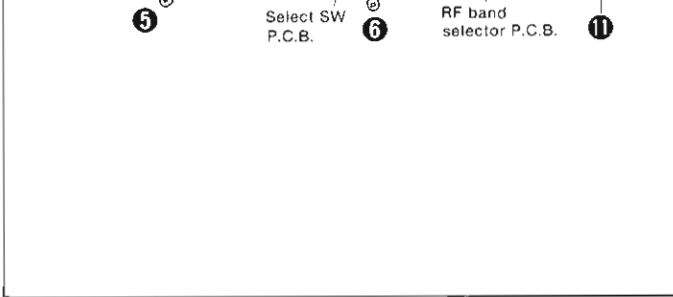
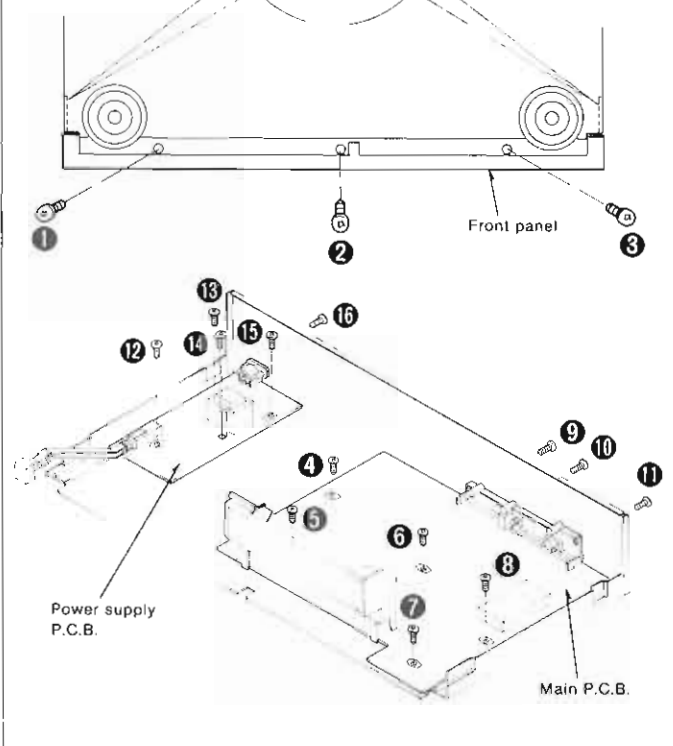
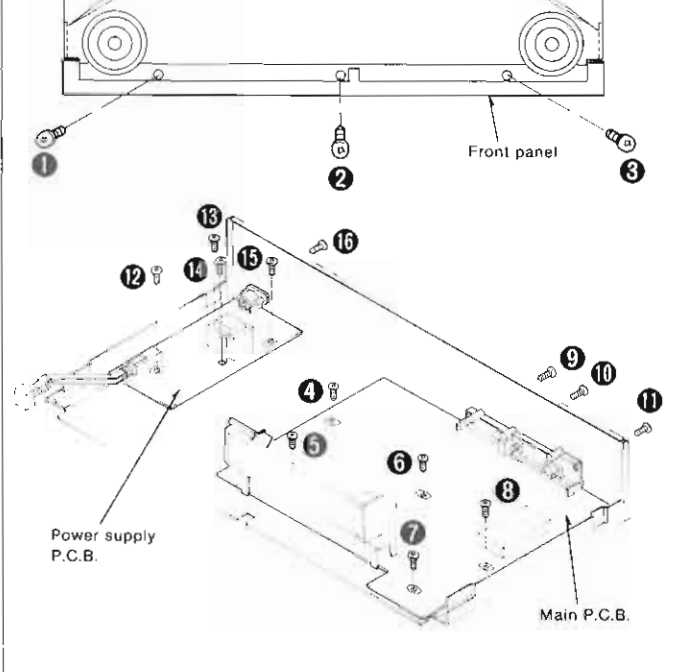
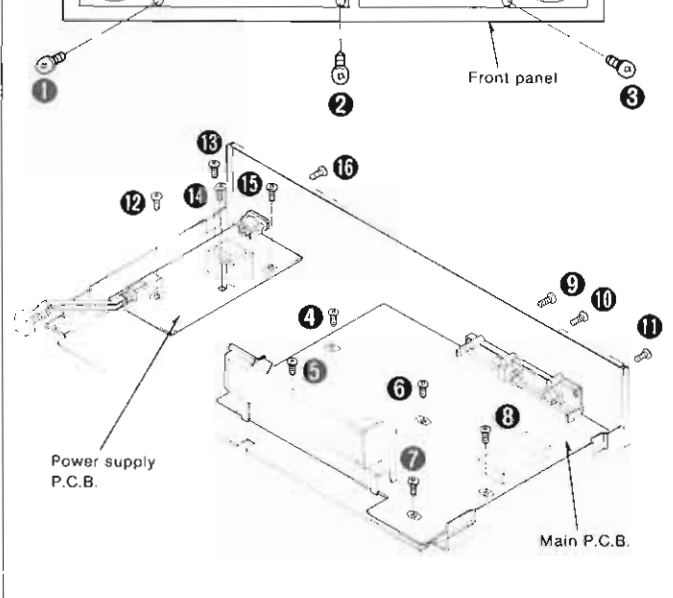
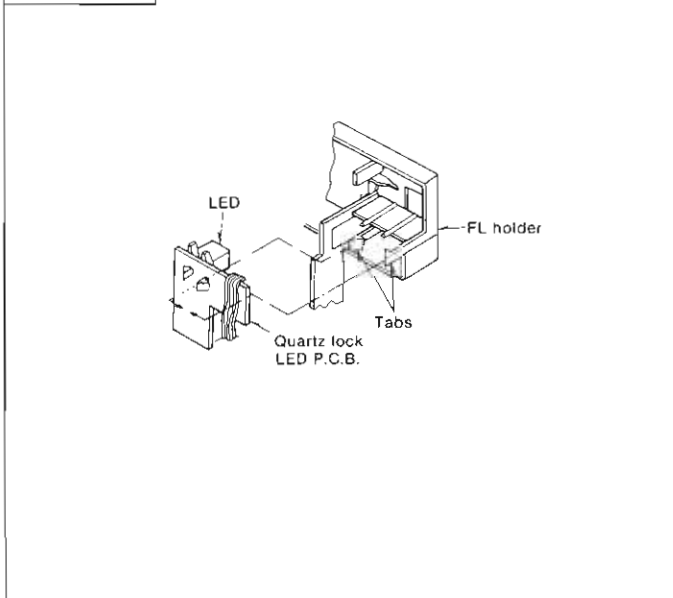
The channel number selected by the preset-tuning buttons is displayed.

I Digital frequency display

The reception frequency of the FM or AM broadcast selected by using the tuning control or the preset-tuning buttons is indicated.

J Band indicator (band)

DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the cabinet	Ref. No. 3	How to remove the LED/operation SW P.C.B., RF band selector P.C.B. and tuning VR P.C.B.
Procedure 1	<ul style="list-style-type: none"> Remove the 5 screws (①~⑤). 	Procedure 1 → 2 → 3	
		<p>(1) How to remove the LED/operation SW P.C.B.</p> <ul style="list-style-type: none"> Remove the 8 screws (①~⑧). <p>(2) How to remove the RF band selector P.C.B.</p> <ul style="list-style-type: none"> Remove the 3 screws (⑨~⑪). <p>(3) How to remove the tuning VR P.C.B.</p> <ul style="list-style-type: none"> Remove the tuning VR with hexagonal wrench. Remove the nut. 	
			
Ref. No. 2	How to remove the main P.C.B. and power supply P.C.B.		
Procedure 1 → 2	<p>(1) How to remove the main P.C.B.</p> <ul style="list-style-type: none"> Remove the 3 screws (①~③). Remove the 2 tabs and the front panel. Remove the 8 screws (④~⑪). <p>(2) How to remove the power supply P.C.B.</p> <ul style="list-style-type: none"> Remove the 5 screws (⑫~⑯). 		
<p>(1) How to remove the main P.C.B.</p> <ul style="list-style-type: none"> Remove the 3 screws (①~③). Remove the 2 tabs and the front panel. Remove the 8 screws (④~⑪). <p>(2) How to remove the power supply P.C.B.</p> <ul style="list-style-type: none"> Remove the 5 screws (⑫~⑯). 			
		Ref. No. 4	How to remove the quartz lock LED P.C.B.
		Procedure 1 → 2 → 4	<ul style="list-style-type: none"> Remove the 2 tabs.
			

“ATTENTION SERVICER”

Some chassis components may have sharp edges. Be careful when disassembling and servicing.

MEASUREMENTS AND ADJUSTMENTS

AM/FM

Control positions and equipment used

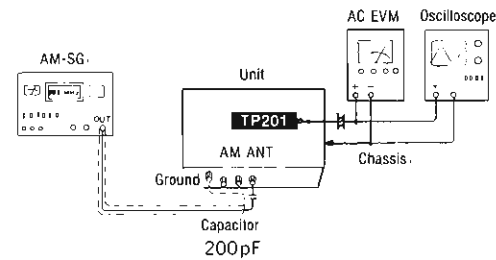
- AM and FM signal generator (AM and FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- Frequency counter
- Choke coil (100 μ H)
- Resistor (100k Ω)
- Ceramic capacitor (200 pF)
- AC and DC electronic voltmeter (EVM)

AM-IF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the to “AM” mode.
3. Set the radio frequency display and signal generator to 450kHz.
4. Adjust T201 for maximum output.

AM SIGNAL GENERATOR CONDITION

Modulation30%
 Modulation frequency.....400Hz



AM-RF ADJUSTMENT

1. Test equipment connection is shown in figure (1).
2. Set the unit to “AM” mode.
3. Set the radio frequency display and signal generator to 530kHz.
4. Adjust L204 so that the voltage measured in signal mode is 1.0V.
5. Test equipment connection is shown in figure (2).
6. Set the radio frequency display and signal generator to 610kHz.
7. Adjust L203 for maximum output.
8. Set the radio frequency display and signal generator to 1500kHz.
9. Adjust CT201 for maximum output.
10. Repeat steps 6~9.

Note: Antenna input level must be as low as possible being free from AGC.

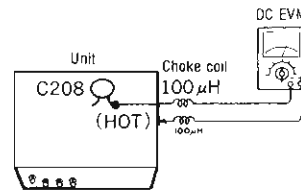


Figure (1)

AM SIGNAL GENERATOR CONDITION

Modulation30%
 Modulation frequency.....400Hz

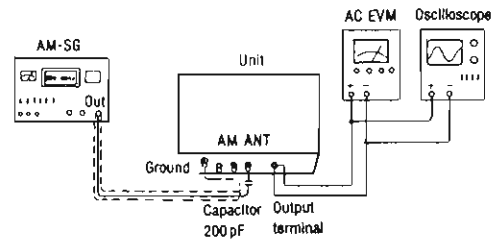


Figure (2)

FM MO

1. Test e
2. Set th
3. Set th
100.10
4. Adjust
signal
5. Adjust
minim
6. Repea
7. Make
nearl

Note: Th
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FM-RF A

1. Test e
2. Set th
3. Set th
90.1M
4. Adjust
5. Set th
100.10
6. Adjust
7. Adjust

MPX VO

1. Test e
2. Set th
3. Set th
100.10
4. Adjust
readi

USING

1. Apply
broa
2. Adjust
of VR

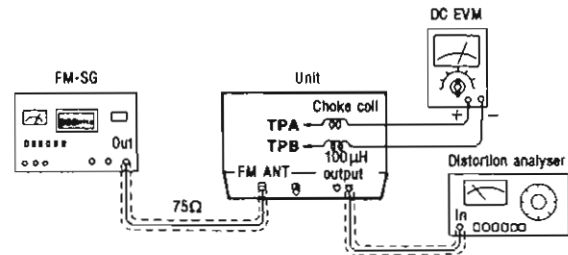
FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM and RF normal" mode.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust the core of T101 so that the voltage measured in signal mode is 0mV in 300mV range.
5. Adjust T105 so that the distortion factor of L-CH is minimized.
6. Repeat steps 4 and 5.
7. Make sure that the distortion factors of L-CH and R-CH are nearly the same and minimum.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION

Modulation100%
 Modulation frequency.....1 kHz
 Output level.....66dB



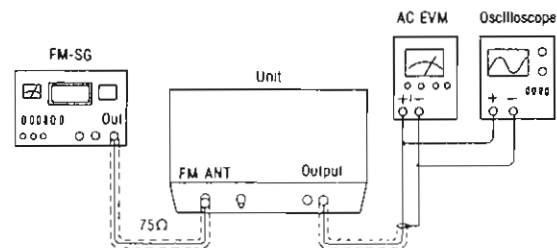
TPA=TP101, TPB=TP102

FM-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM and RF/IF narrow" mode.
3. Set the radio frequency display and signal generator to 90.1 MHz.
4. Adjust L2 and L4 for maximum output.
5. Set the radio frequency display and signal generator to 100.10 MHz.
6. Adjust T1 for maximum output.
7. Adjust T104 for maximum output.

FM SIGNAL GENERATOR CONDITION

Modulation100%
 Modulation frequency.....1 kHz



MPX VCO ADJUSTMENT

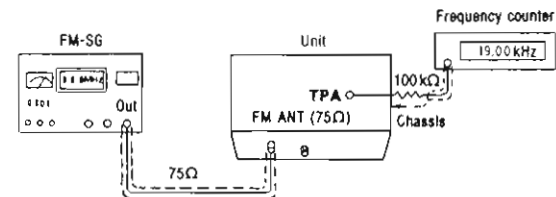
1. Test equipment connection is shown in figure.
2. Set the unit to "on/auto" position.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust VR302 for 19kHz±30Hz on frequency counter reading.

USING ALTERNATE SYSTEM

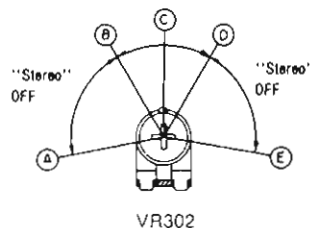
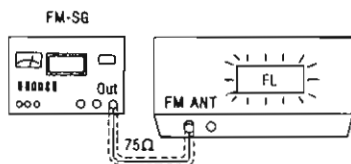
1. Apply stereo signal from generator or receive the stereo broadcast.
2. Adjust VR302 until stereo indicator lights up. Fix the arm of VR302 as shown in figure.

FM SIGNAL GENERATOR CONDITION

Modulation0%
 Modulation frequency.....0
 Output level.....66dB



TPA = TP301, Frequency counter:19.00 kHz



- Ⓐ-Ⓑ, "Stereo" OFF position
- Ⓑ-Ⓓ..... "Stereo" ON position (Indicator lighting)
- Ⓒ..... Adjust point of pilot circuit

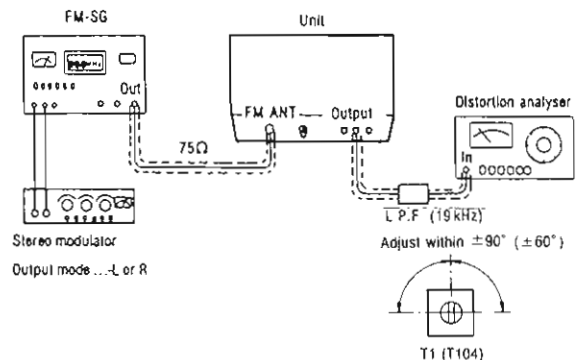
FM STEREO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM and RF/IF normal" mode.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust T1 so that the distortion factor of L-CH is minimized.
5. Make sure that the distortion factors of L-CH and R-CH are nearly the same with each other to minimum.
6. Set the unit to "IF narrow" mode.
7. Adjust T104 so that the distortion factor of L-CH is minimized.
8. Make sure that the distortion factors of L-CH and R-CH are nearly the same with each other to minimum.

- Note:**
1. The adjusting screwdriver used should be made of resin.
 2. T1 should be rotated no more 1/4 turn (90 deg.) on either side.
 3. T104 should be rotated no more 1/6 turn (60 deg.) on either side.

FM SIGNAL GENERATOR CONDITION

Modulation "L" mode or "R" mode 45%,
Pilot 10%
Modulation frequency 1 kHz (Pilot 19 kHz)
Output level 66 dB

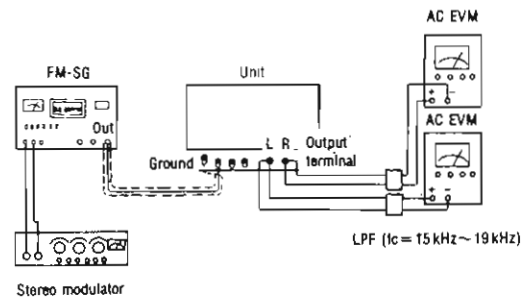


SEPARATION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM and RF/IF normal" mode.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust VR301 so that the R-CH output is minimized when stereo modulator is in "L" (L-CH modulation) mode.

FM SIGNAL GENERATOR CONDITION

Modulation "L" mode or "R" mode 45%,
Pilot 10%
Modulation frequency 1 kHz (Pilot 19 kHz)
Output level 66 dB

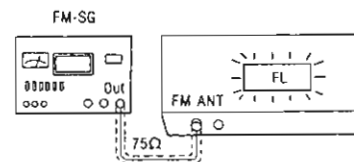


FM SIGNAL STRENGTH LEVEL ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM and RF/IF normal" mode.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Change LCD display from "frequency" to "dB" by pressing the FM signal button.
5. Adjust VR103 so that 50 dB is indicated. "50 dB" is indicated on the LCD display.
6. Adjust VR102 so that 70 dB is indicated. "70 dB" is indicated on the LCD display.
7. Adjust VR101 so that 86 dB is indicated. "86 dB" is indicated on the LCD display.
8. Repeat steps 5~7.

FM SIGNAL GENERATOR CONDITION

Modulation 30%
Modulation frequency 1 kHz
Output level 56, 76, 92 dB

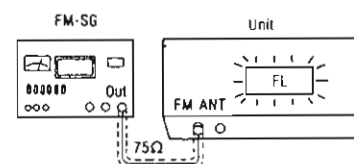


FM IF NARROW GAIN ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM and RF/IF normal" mode.
3. Change LCD display from "frequency" to "dB" by pressing the FM signal button.
4. Confirm that "dB" is indicated.
5. Set the unit to "IF narrow" mode.
6. Adjust VR105 that the "dB" of "IF normal" and "IF narrow" are the same with each other.

FM SIGNAL GENERATOR CONDITION

Modulation 30%
Modulation frequency 1 kHz
Output level 26 dB

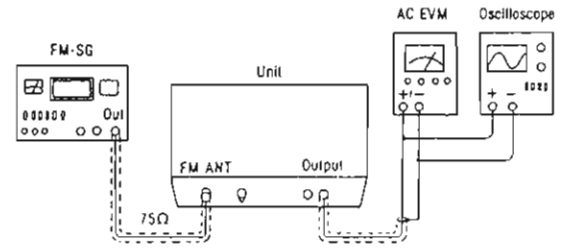


38kHz CANCEL CIRCUIT ADJUSTMENT

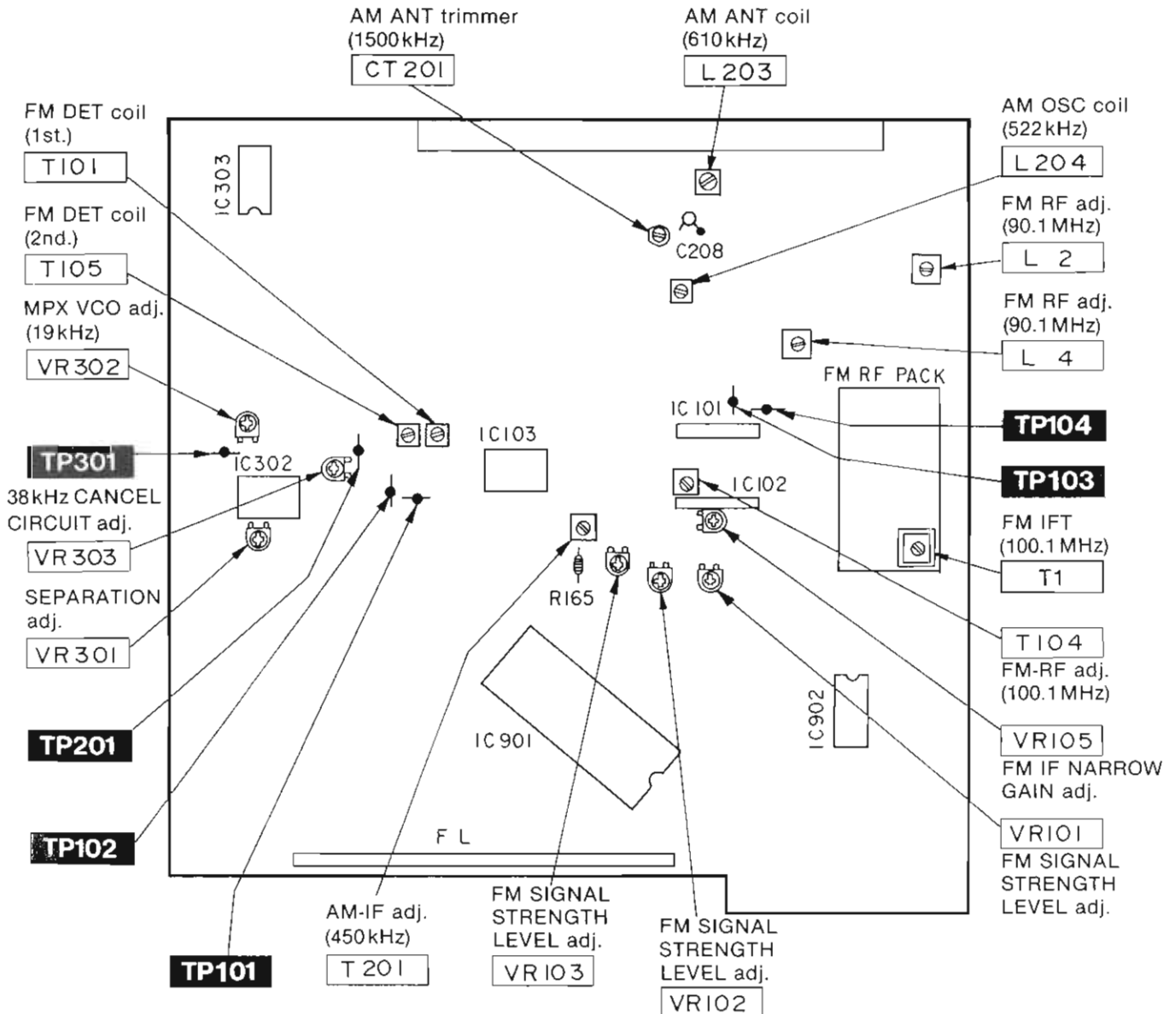
1. Test equipment connection is shown in figure.
2. Set the unit to "FM" position.
3. Set the radio frequency display and signal generator to **100.10MHz**.
4. Adjust **VR303** so that the output is minimized.

FM SIGNAL GENERATOR CONDITION


ModulationStereo "L+R" mode 0%
 Pilot 10%
 Modulation frequency.....1kHz (Pilot 19kHz)
 Output level.....66dB

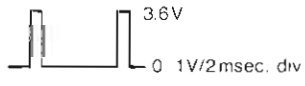
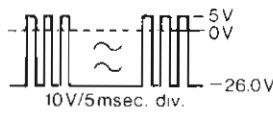
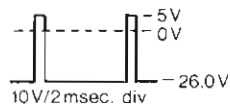


• **Adjustment Points**



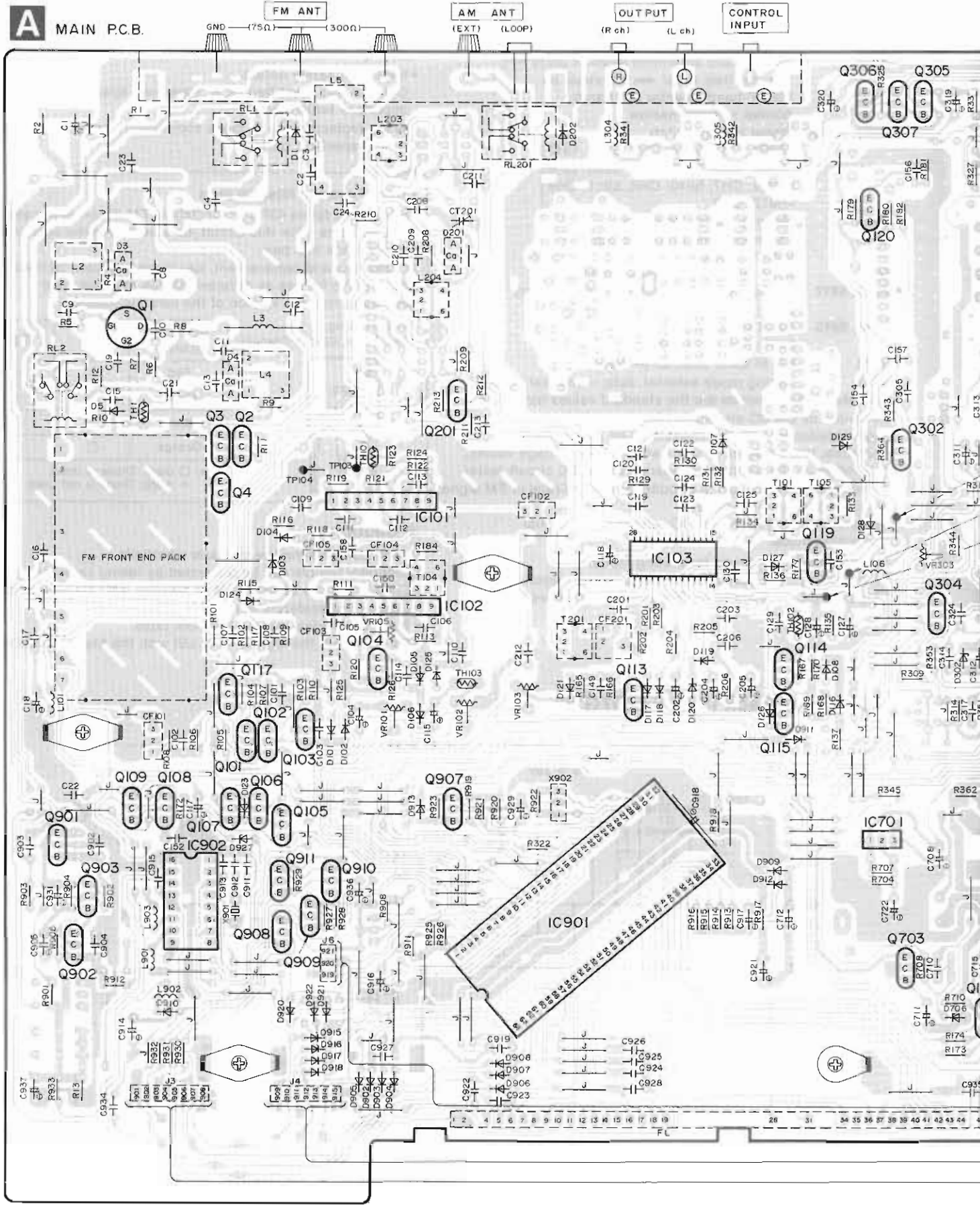
FUNCTION OF TERMINAL (IC901: M50941-421SP)

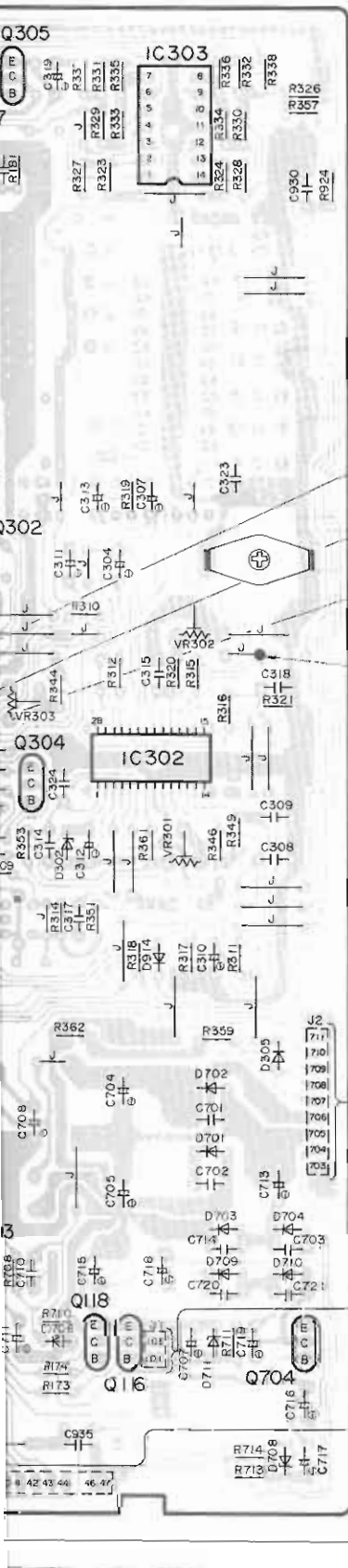
PIN NO.	IN/OUT	MARK	DESCRIPTION OF TERMINAL
1	INPUT	VREF	Reference voltage terminal.
2	—	NC	Not used in this unit.
3	INPUT	A	Tuning volume up/down control terminal.
4		B	
5 6 7	INPUT	SSL1 } SSL3	FM signal level detector terminal.
8	INPUT	SD	Station detection of auto tuning terminal. •Received: "H", No signal: "L"
9	INPUT	STEREO	Stereo signal detection terminal. •Stereo: "L", Monaural: "H"
10 17	OUTPUT	TUNING 0 • TUNING 1	Tuning mode LED (auto/manual/lock) drive terminal.
11	OUTPUT	RF BAND	FM RF BAND selector terminal. •"normal": "L", "super narrow": "H"
12	OUTPUT	IF BAND	FM IF BAND selector terminal. •"normal": "L", "super narrow": "H"
13	—	NC	Not used in this unit.
14	OUTPUT	REC	REC carribration (333Hz) signal terminal. •REC switch ON: "H", REC switch OFF: "L"
15	OUTPUT	MONO	Forcible monaural selection terminal.  Forcible monaural mode
16	OUTPUT	MUTE	Terminal to eliminate shock noise due to unlocking at PLL. <Muting output> •Pin 25 (CE) is "L"→"H" or "H"→"L" •Power switch "off". •Frequency change. (up/down, FM→AM (MW/LW), REC). •FM RF/IF selection.
18	OUTPUT	SRDY	PLL data output terminal. SRDY: serial I/O enable signal, CLK: clock signal, SOUT: serial data signal.
19		CLK	
20		SOUT	
21	INPUT	SIN	Control input terminal.
22	OUTPUT	T1	Clock pulse waveform output terminal. •FM: 1 kHz signal (duty 50%)
23	OUTPUT	T2	Clock pulse waveform output terminal. •REC "ON": 333Hz signal (duty 50%)

PIN NO.	IN/OUT	MARK	DESCRIPTION OF TERMINAL
24	INPUT	$\overline{\text{INT1}}$	Remote control input terminal. Not used in this unit.
25	INPUT	$\overline{\text{INT2}}$	Power supply detection terminal.
26 • 32	—	Vss	Ground terminal.
27	INPUT	RESET	Reset signal terminal.
28	INPUT	XIN	Connecting terminal for crystal oscillator.
29	OUTPUT	XOUT	
30	—	XCIN	Not used in this unit.
31	—	XCOU	
33	—	NC	
34 } 37	INPUT	R0 } R3	Terminal for key return signal to external key matrix. 
38	INPUT	VP	Power supply terminal for FL display.
39 } 54	OUTPUT	S0 } S15	Segment signal terminal for FL display. 
55	—	NC	Not used in this unit.
56 } 62	OUTPUT	T1 } T7	Terminal for key scan signal to external key matrix and grid signal terminal for FL display. 
63	INPUT	AVcc	Power supply terminal of device.
64	INPUT	Vcc	

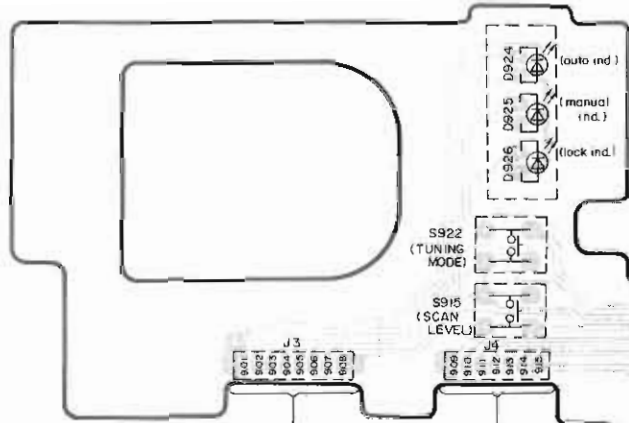
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

A MAIN P.C.B.

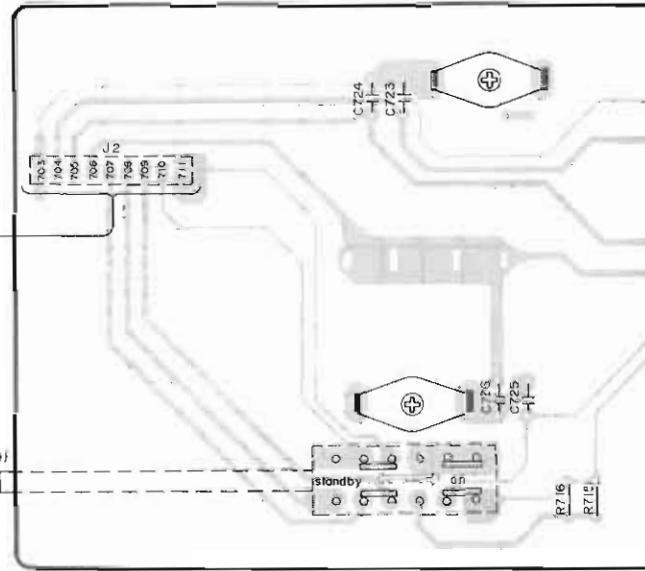




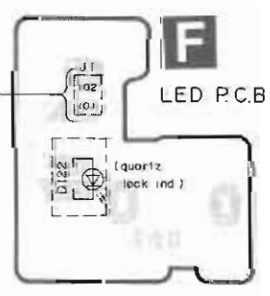
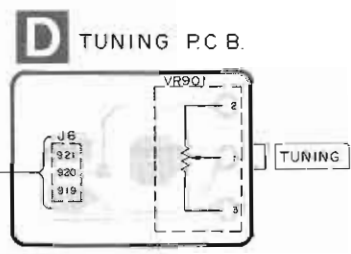
- AM IF adj. TP201
- FM mono distortion adj. TP102
- FM mono distortion adj. TP101
- FM MPX VCO adj. TP301



B LED/OPERATION SWITCH P.C.B.



E POWER SUPPLY P.C.B.



F LED P.C.B.

10

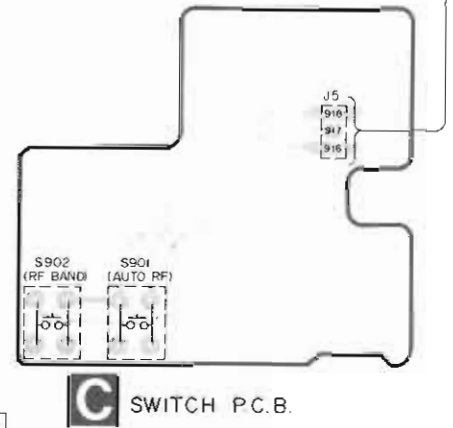
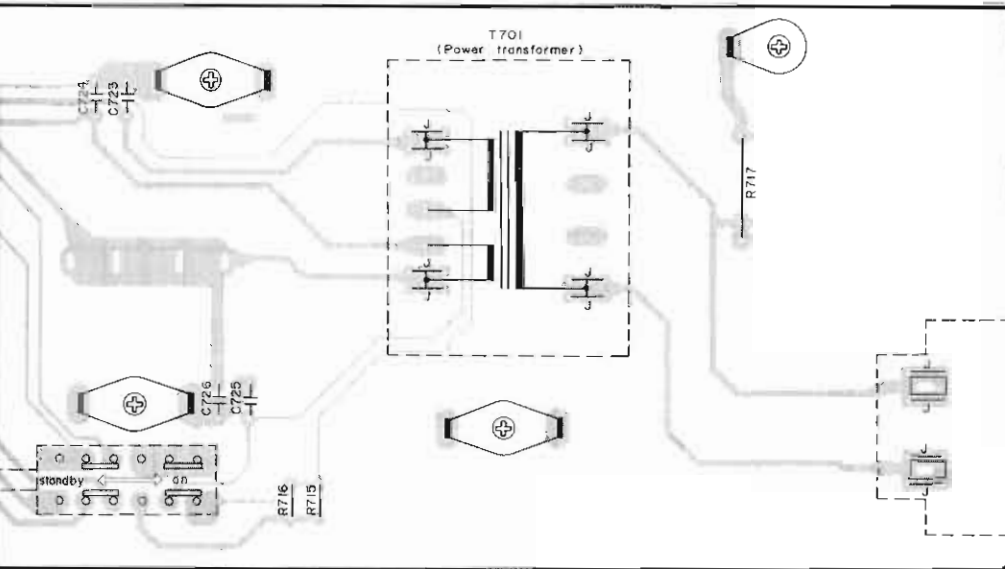
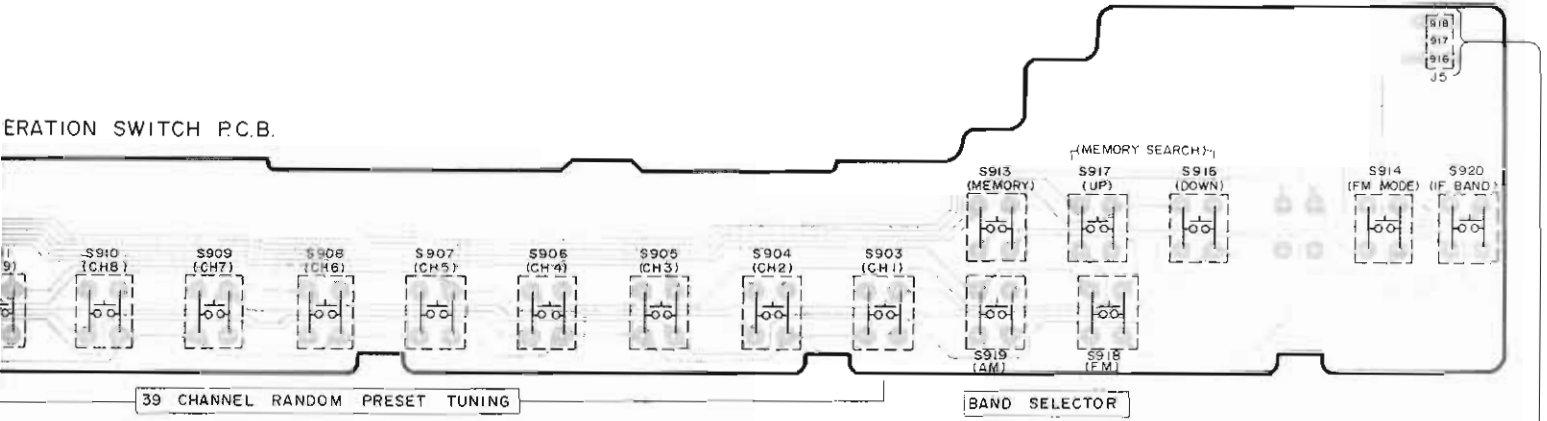
11

12

13

14

OPERATION SWITCH P.C.B.



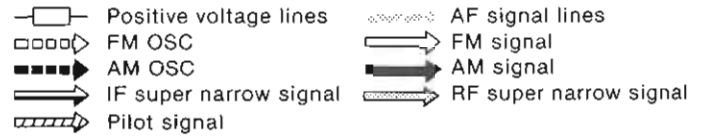
Y P.C.B.

SCHEMATIC DIAGRAM

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

Note 1:

- **S701** : Power switch in "ON" position.
- **S901** : FM RF-band automatic-selector (auto RF).
 — set freq. only/ — all preset ch
- **S902** : FM RF-band selector (RF band).
 normal ↔ super narrow
- **S903~S912**: Preset tuning switch.
 { S903: CH1, S904: CH2, S905: CH3 }
 { S906: CH4, S907: CH5, S908: CH6 }
 { S909: CH7, S910: CH8, S911: CH9 }
 { S912: CH0 }
- **S913** : Memory switch. (memory).
- **S914** : FM mode selector (FM mode).
 auto ↔ mono
- **S915** : Scan level selector (scan level).
- **S916, S917** : Memory search switch (memory search).
 S916: down, S917: up
- **S918, S919** : Band selectors.
 S918: FM, S919: AM
- **S920** : FM IF band selector (IF band).
- **S922** : Tuning mode selector auto ↔ manual ↔ lock
- 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. All voltage values shown in circuitry are DC voltage in FM signal (no signal) reception modes.
- * Figures in () stand for DC voltage in AM signal reception mode.
- * Figures in [] stand for muting mode.
- * Figures in < > stand for RF band "super narrow" mode.
- * Figures in « » stand for IF band "super narrow" mode.



- 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.

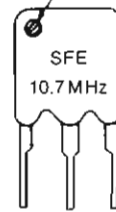
Note 2:

Use of ceramic filters in pairs

The ceramic filters (CF101~CF105) for FM-IF circuit are available in three versions. For this circuit, be sure to use the ceramics of the same version in a pair.

At repairing and replacement, pay close attention to the diodes (D921, D922) for use as different diodes must be used depending on each version of the ceramic filters.

Color marking (Red, Black, Blue or Orange)



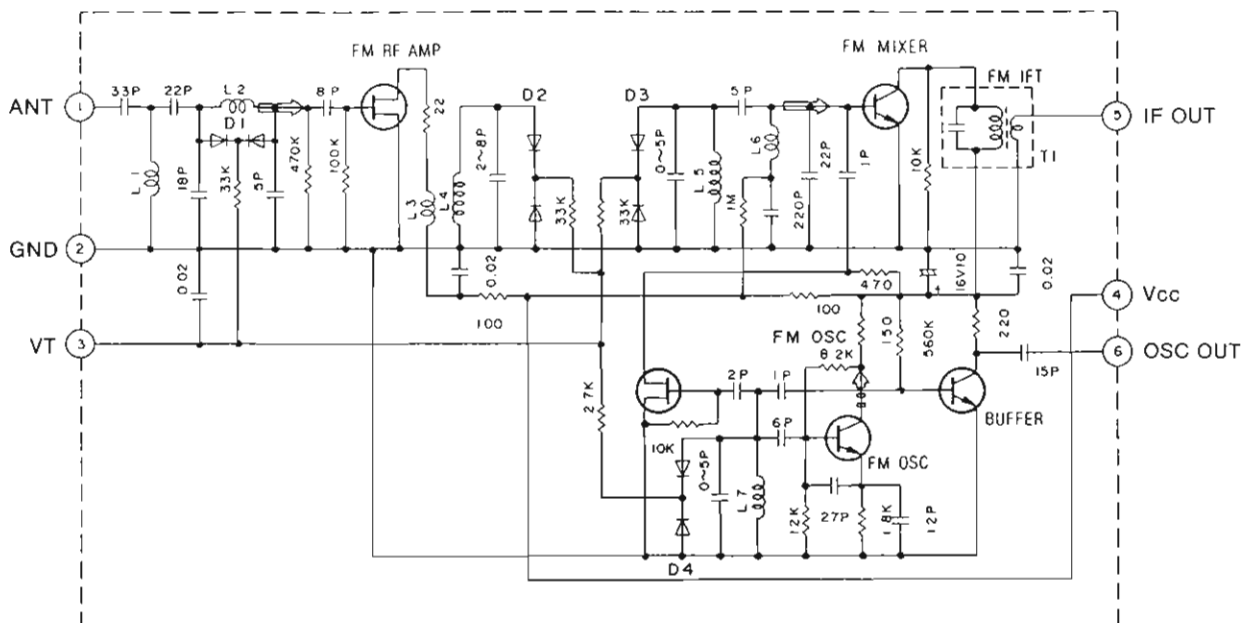
VERSION (Color)	D921	D922
Red	×	×
Black	○	×
Blue	×	○
Orange	○	○

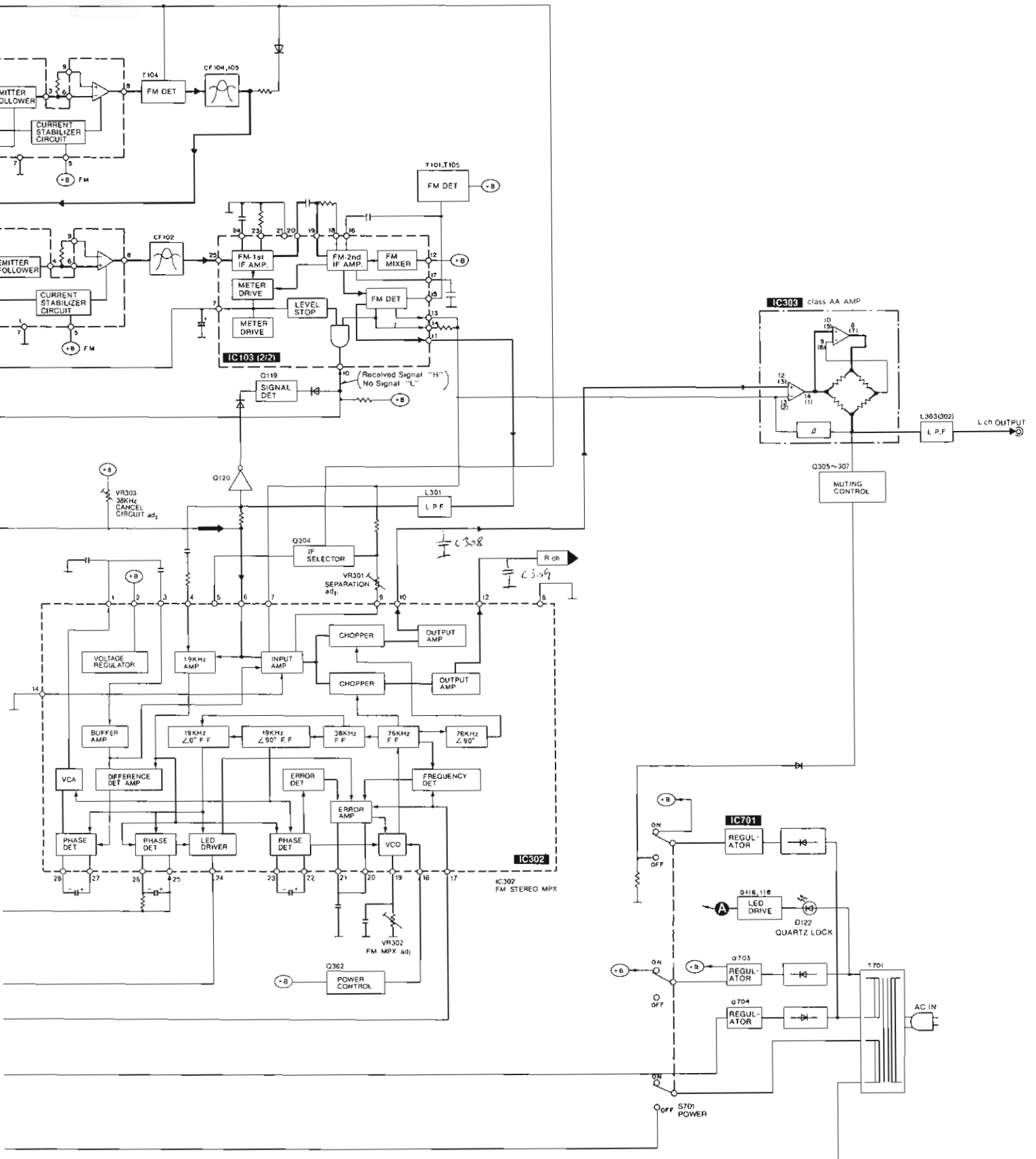
Note: ○ mark: Diode is used.
 × mark: Diode is not used.

*** Caution!**

- IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

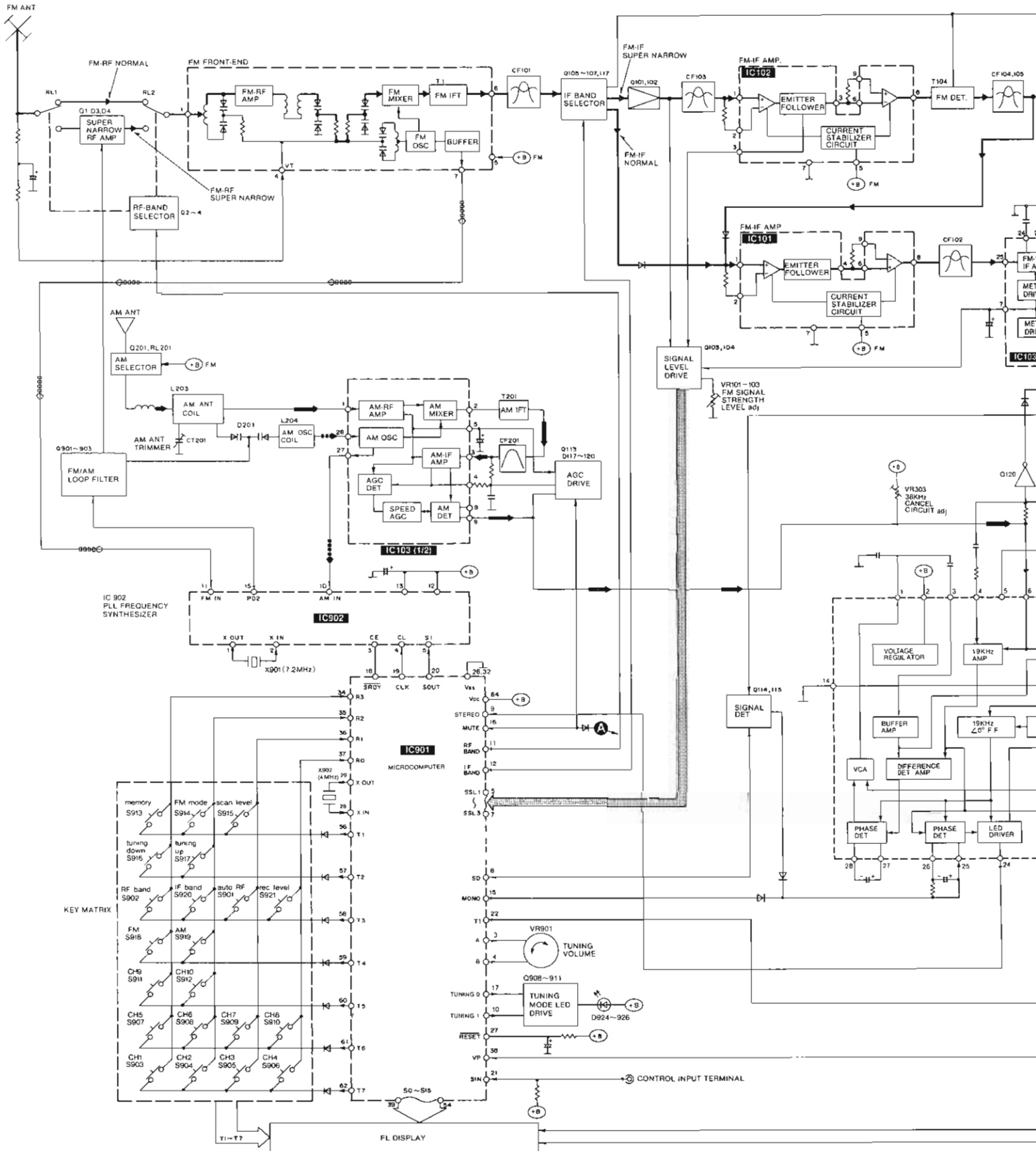
• **FM Tuner Pack (SNVFE407G29)**





- Note)**
- → FM signal
 - □□□□ → FM OSC
 - → AM signal
 - ■■■■ → AM OSC

BLOCK DIAGRAM



1

2

3

4

5

A

B

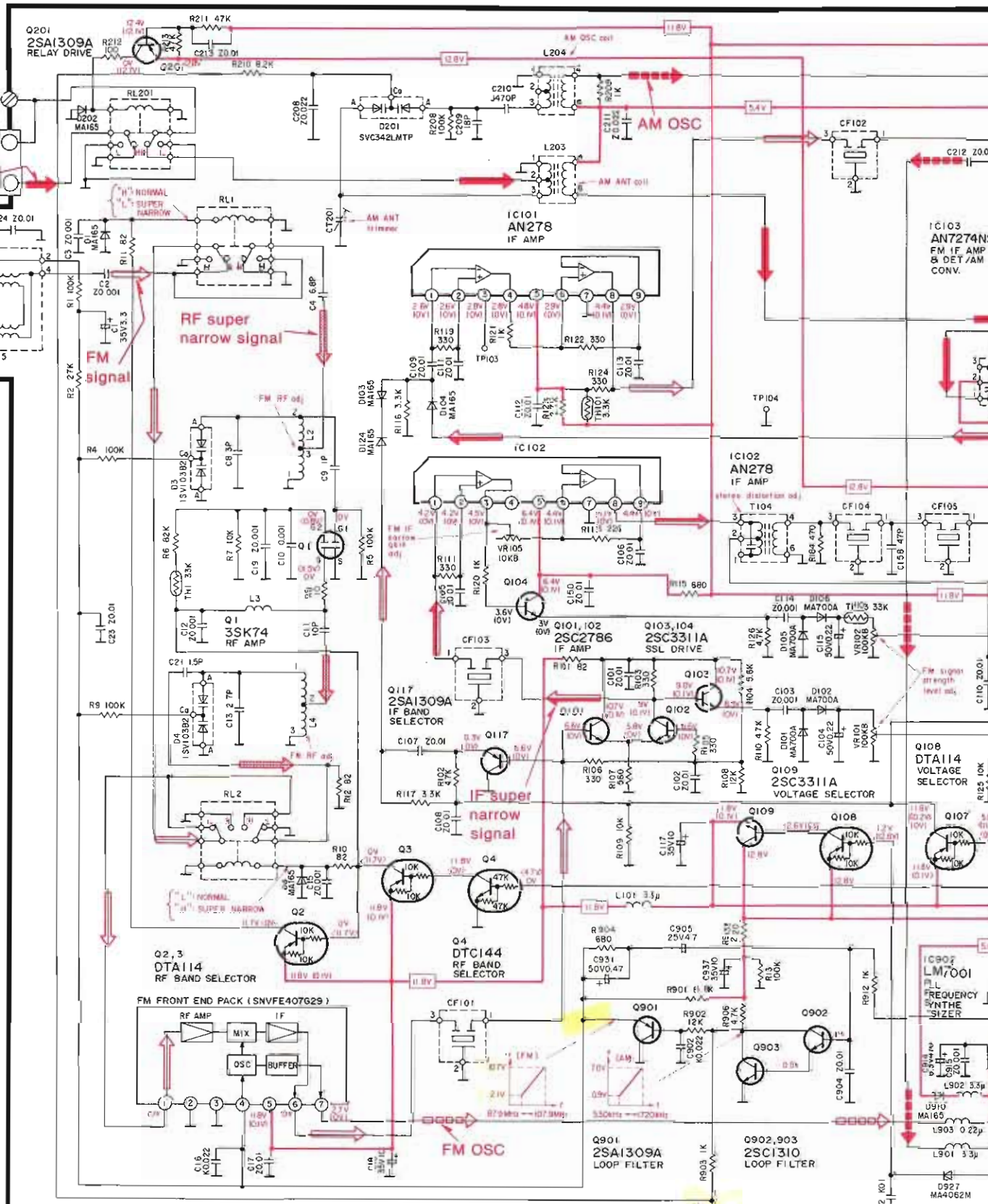
C

D

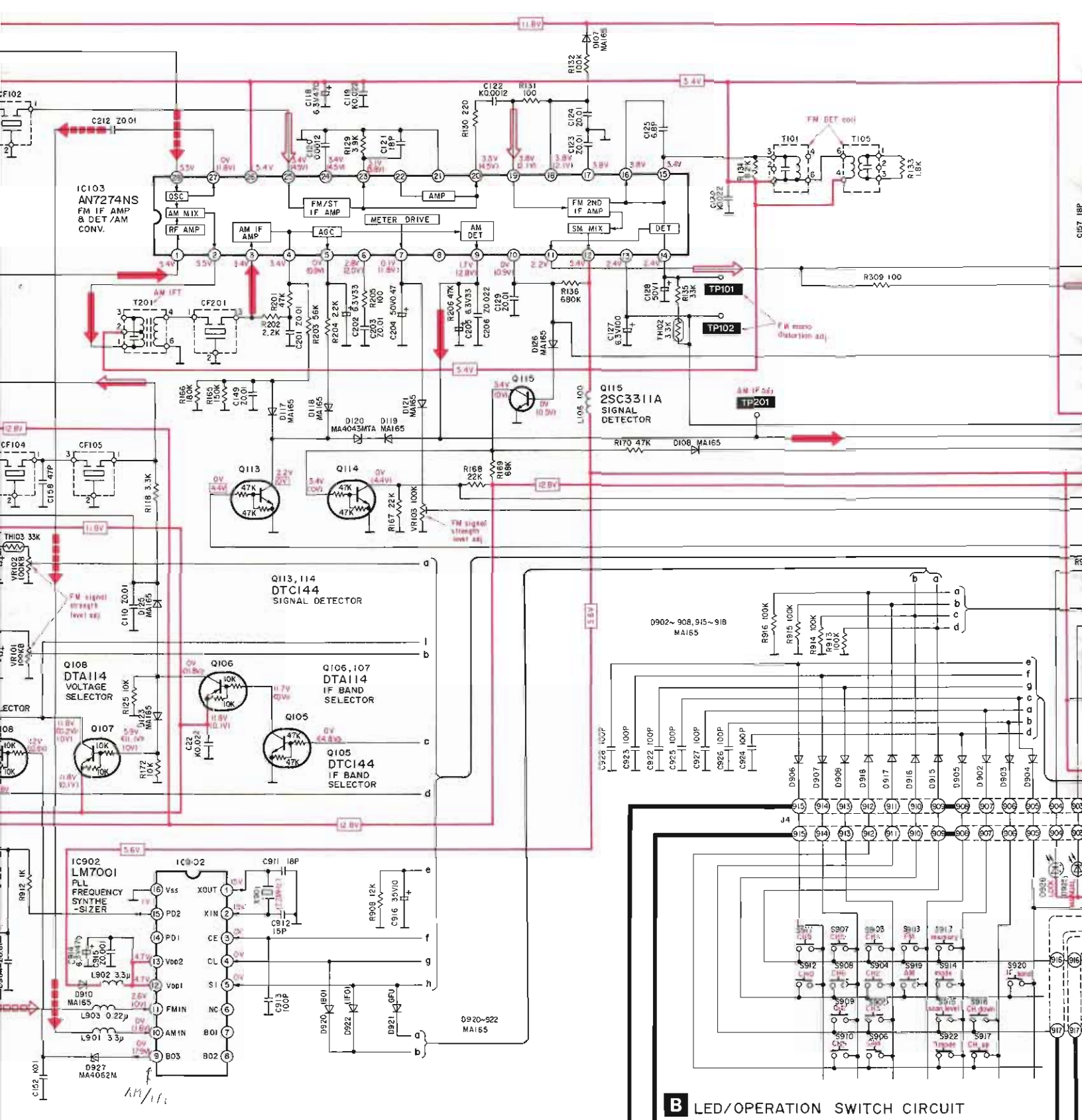
E

F

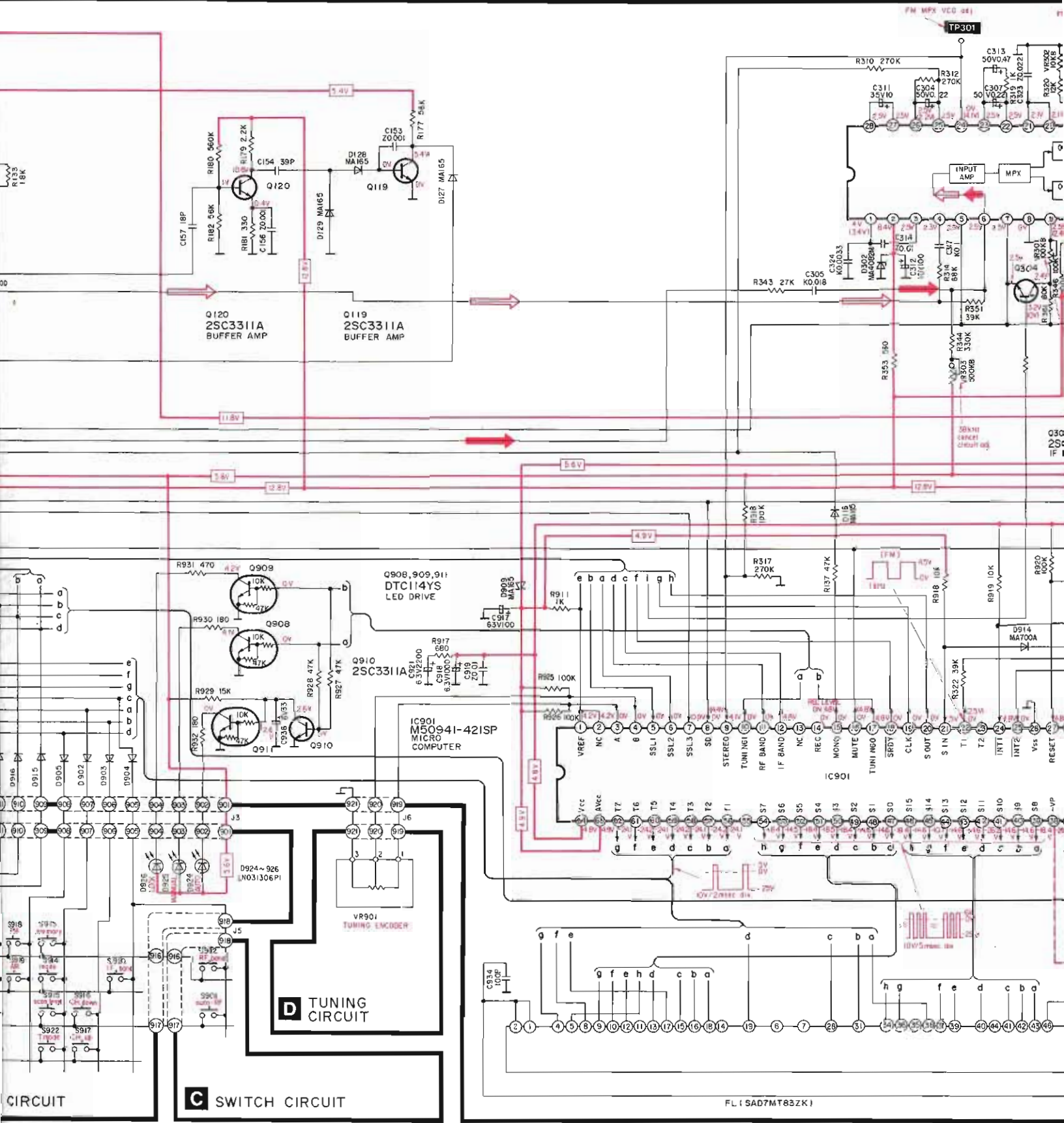
G

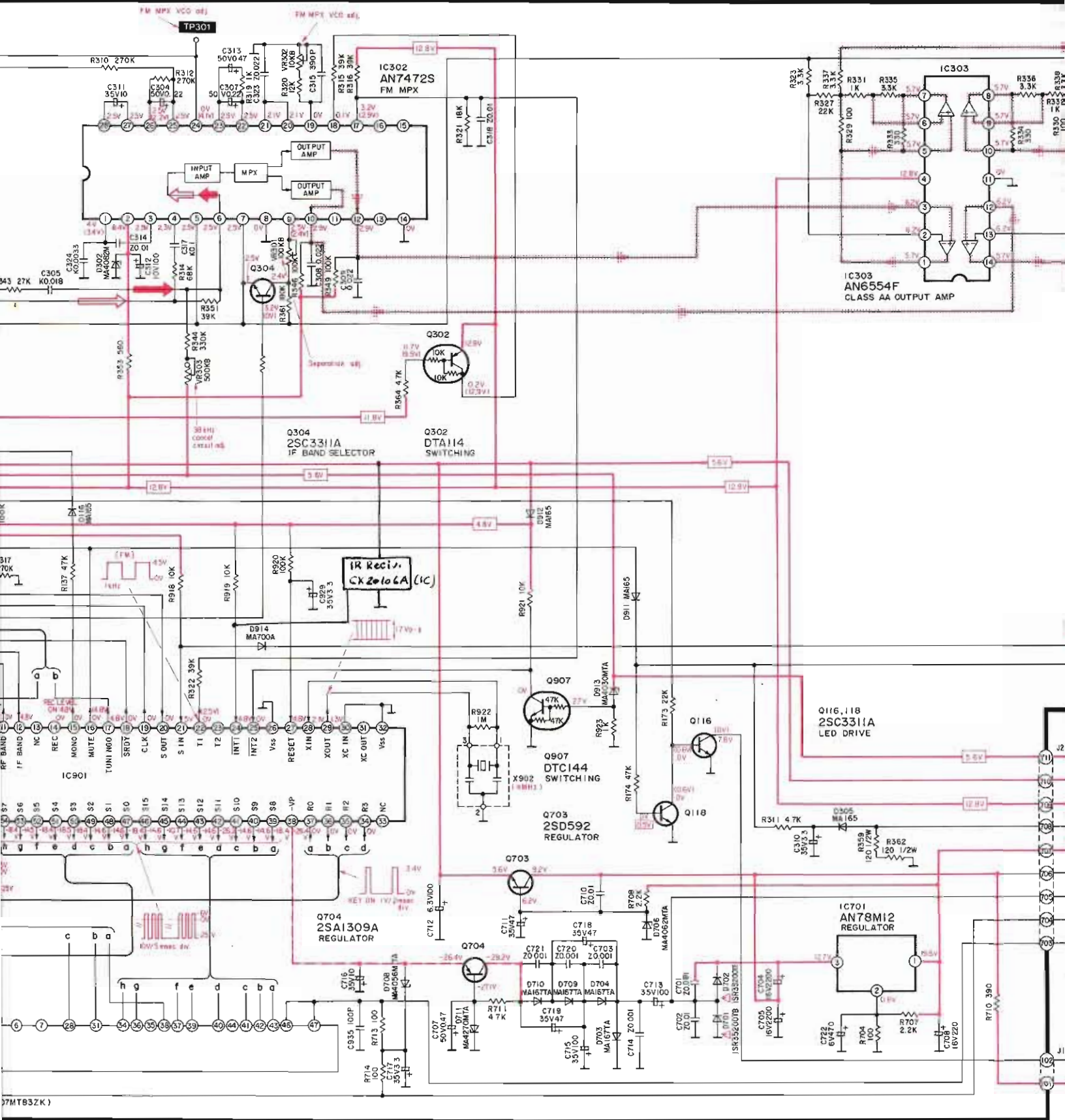


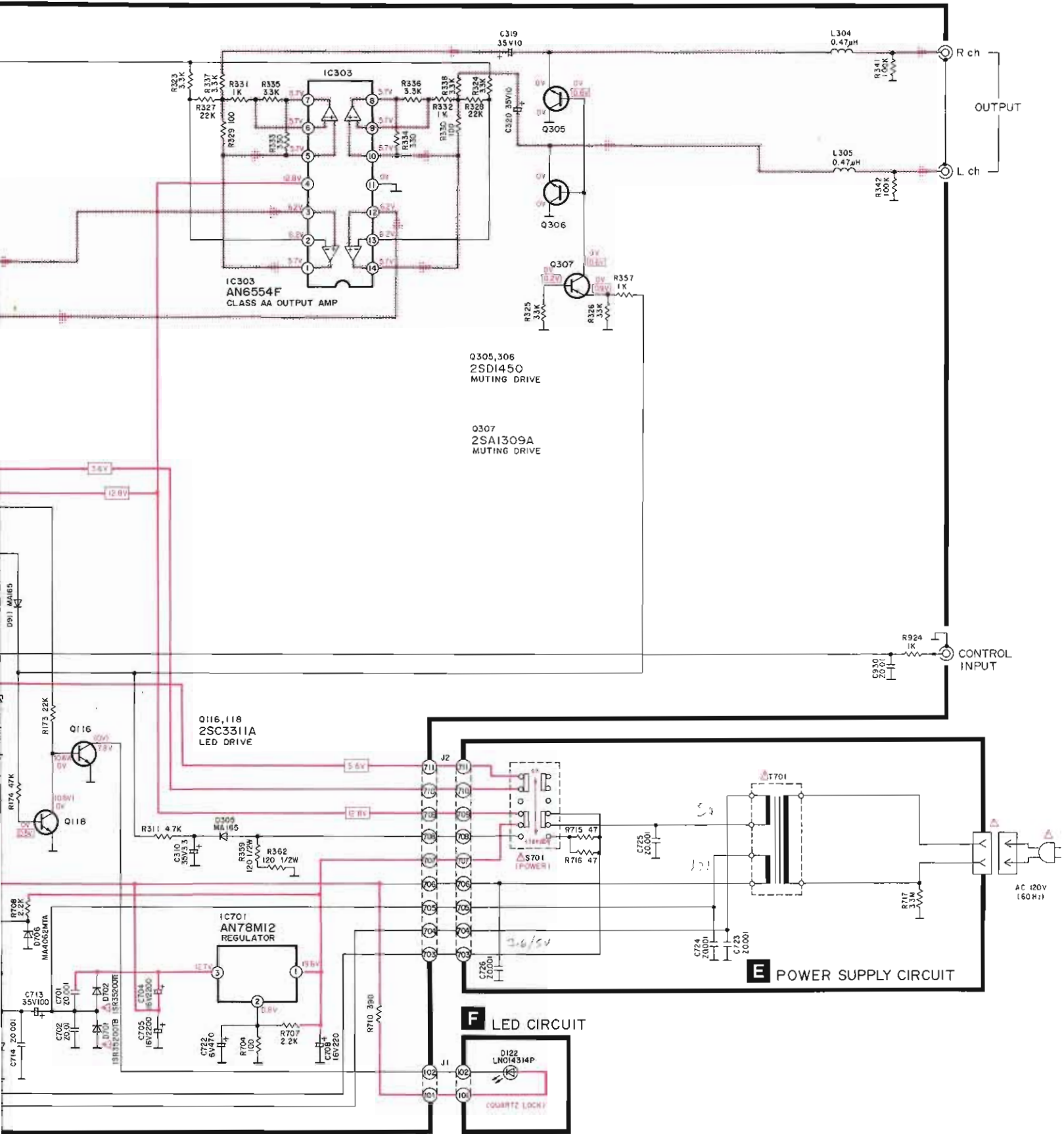
A MAIN CIRCUIT



B LED/OPERATION SWITCH CIRCUIT

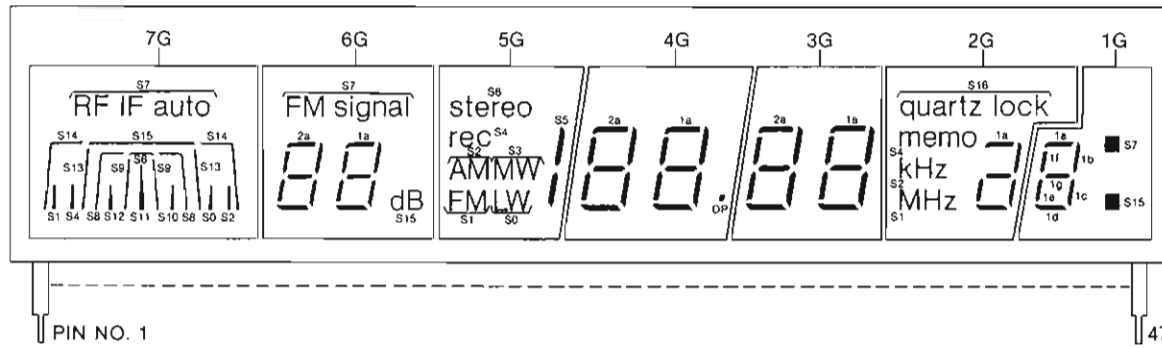






DESCRIPTION OF FL PANEL

GRID ASSIGNMENT



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
CONNECT-ION	N P	F I	N P	7 G	S 8	S 9	S 10	S 11	S 12	7 G	S 13	S 14	6 G	S 15	N P	N P	6 G	N P	N P	5 G	N P	N P	N P	N P
PIN NO.	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
CONNECT-ION	N P	N P	N P	N P	4 G	S 0	3 G	S 1	S 2	3 G	S 3	S 4	2 G	S 5	S 6	2 G	S 16	1 G	S 7	1 G	N P	F 2	N P	

ANODE ASSIGNMENT

	7G	6G	5G	4G	3G	2G	1G
S0		2d	LW	2d	2d	-	-
S1		2e	FM	2e	2e	MHz	-
S2		2c	AM	2c	2c	kHz	-
S3	-	2g	MW	2g	2g	-	-
S4		2f	rec	2f	2f	memo	-
S5	-	2b	/	2b	2b	-	-
S6	—	2a	stereo	2a	2a	-	-
S7	RF IF auto	FM signal	-	-	-	-	■
S8	∩	1d	-	1d	1d	1d	1d
S9	/ \	1e	-	1e	1e	1e	1e
S10		1c	-	1c	1c	1c	1c
S11		1g	-	1g	1g	1g	1g
S12		1f	-	1f	1f	-	1f
S13	/ \	1b	-	1b	1b	1b	1b
S14	∩	1a	-	1a	1a	1a	1a
S15	—	dB	-	DP	-	-	■
S16	-	-	-	-	-	quartz lock	-

Pin
Pin
Pin

3M12

1. Vin
2. GND
3. Vout

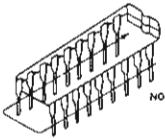
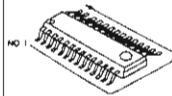
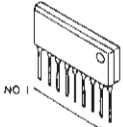
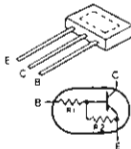
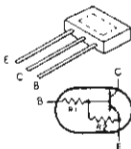
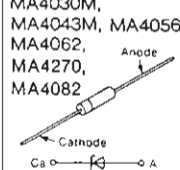
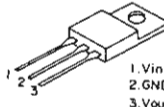
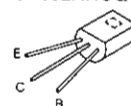
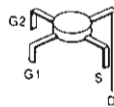
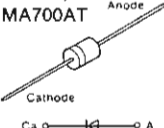
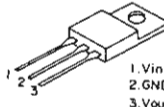
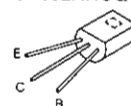
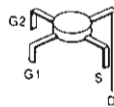
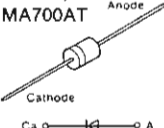
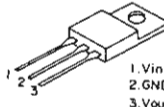
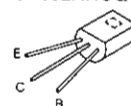
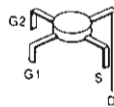
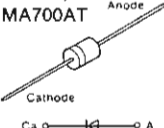
0EFG,
ANCO

74L1

MA165,
Anode

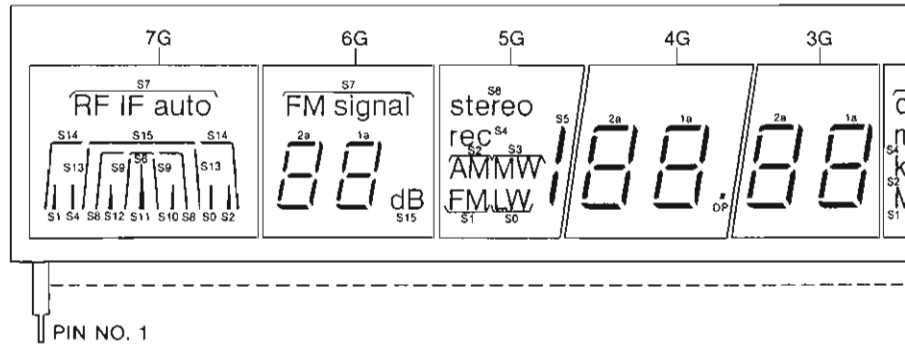
A
B
C
D
E
F
G

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

	<table border="1"> <tr><td>LM7001</td><td>16 Pin</td></tr> <tr><td>AN6554F</td><td>14 Pin</td></tr> <tr><td>M50941-421SP</td><td>64 Pin</td></tr> </table>	LM7001	16 Pin	AN6554F	14 Pin	M50941-421SP	64 Pin		
LM7001	16 Pin								
AN6554F	14 Pin								
M50941-421SP	64 Pin								
	<table border="1"> <tr><td>AN7274NS</td><td>28 Pin</td></tr> <tr><td>AN7472S</td><td></td></tr> </table>	AN7274NS	28 Pin	AN7472S					
AN7274NS	28 Pin								
AN7472S									
	<table border="1"> <tr><td>AN278</td><td>9 Pin</td></tr> </table>	AN278	9 Pin						
AN278	9 Pin								
	<table border="1"> <tr><td>DTC144A</td><td>2SA1309A-R, 2SC2786M, 2SC3311A-Q, 2SD1450TTA</td></tr> </table>	DTC144A	2SA1309A-R, 2SC2786M, 2SC3311A-Q, 2SD1450TTA						
DTC144A	2SA1309A-R, 2SC2786M, 2SC3311A-Q, 2SD1450TTA								
	<table border="1"> <tr><td>DTA114YSTP</td><td>SVC342LMTP, 1SV103B2</td></tr> </table>	DTA114YSTP	SVC342LMTP, 1SV103B2						
DTA114YSTP	SVC342LMTP, 1SV103B2								
	<table border="1"> <tr><td>MA4030M, MA4043M, MA4056, MA4062, MA4270, MA4082</td><td>LN014314P LN031306P1</td></tr> </table>	MA4030M, MA4043M, MA4056, MA4062, MA4270, MA4082	LN014314P LN031306P1						
MA4030M, MA4043M, MA4056, MA4062, MA4270, MA4082	LN014314P LN031306P1								
	<table border="1"> <tr><td>AN78M12</td><td></td></tr> <tr><td>2SC1310EFG, 2SD592ANCQ</td><td></td></tr> <tr><td>3SK74L1</td><td></td></tr> <tr><td>1SR35200, MA165, MA167, MA700AT</td><td></td></tr> </table>	AN78M12		2SC1310EFG, 2SD592ANCQ		3SK74L1		1SR35200, MA165, MA167, MA700AT	
AN78M12									
2SC1310EFG, 2SD592ANCQ									
3SK74L1									
1SR35200, MA165, MA167, MA700AT									

■ DESCRIPTION OF FL PANEL

• GRID ASSIGNMENT



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CONNECT-ION	N P	F 1	N P	7 G	S 8	S 9	S 10	S 11	S 12	7 G	S 13	S 14	6 G	S 15	N P	N P	6 G	N P
PIN NO.	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
CONNECT-ION	N P	N P	N P	N P	4 G	S 0	3 G	S 1	S 2	3 G	S 3	S 4	2 G	S 5	S 6	2 G	S 16	1 G

• ANODE ASSIGNMENT

	7G	6G	5G	4G	3G
S0		2d	LW	2d	2d
S1		2e	FM	2e	2e
S2		2c	AM	2c	2c
S3	-	2g	MW	2g	2g
S4		2f	rec	2f	2f
S5	-	2b	/	2b	2b
S6	—	2a	stereo	2a	2a
S7	RF IF auto	FM signal	-	-	-
S8	┌ ┐	1d	-	1d	1d
S9	/ \	1e	-	1e	1e
S10		1c	-	1c	1c
S11		1g	-	1g	1g
S12		1f	-	1f	1f
S13	/ \	1b	-	1b	1b
S14	┌ ┐	1a	-	1a	1a
S15	—	dB	-	DP	-
S16	-	-	-	-	-