

SERVICE MANUAL

& PARTS LIST (without price)

POCKET TELEVISION

TV-470C

TV-470D

TV-470N

MAY 1991

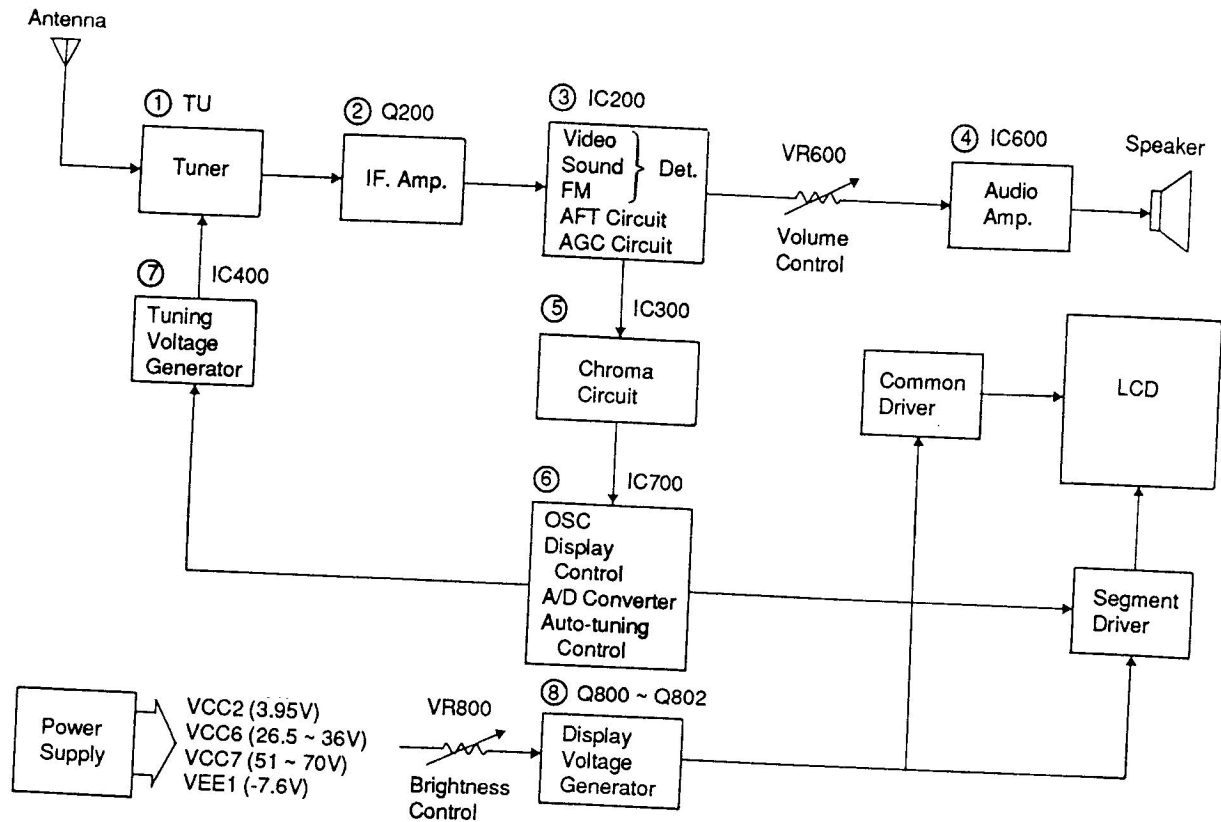
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CASIO®

SPECIFICATIONS

Item	Specification
1. Reception channels	TV-470C : VHF 2 ~ 12ch UHF : 21 ~ 69ch TV-470D : VHF — UHF : 21 ~ 68ch TV-470N : VHF 2 ~ 12ch UHF : 21 ~ 69ch
2. Power voltage	DC 6.0V
3. Power consumption	Approx. 2.7 W
4. Current consumption	Approx. 450 mA
5. Battery life (with alkaline batteries)	Approx. 3.0 hours
6. Power supply	Batteries: 4AA size batteries Car adaptor: CA-K65 AC adaptor: AD-K64, 65
7. Connection terminals	Earphone jack: 3.5ø mini External power jack: 6.0V DC IN External antenna jack: 3.5ø mini
8. Screen size	2.2 inches
9. No. of picture element	39,600 (110 x 360) dots
10. Dimensions	138 mm (H) x 81 mm (W) x 36 mm (D) 5-1/4" (H) x 3-1/4" (W) x 1-1/2" (D)
11. Weight	250g excepting batteries 8.8 oz excepting batteries
12. Standard accessories	Soft case and Test batteries (R6 x 4)
13. Options	AC adaptor: AD-K64,65 Car adaptor: CA-K65 RF connector: CF-13M Antenna matching device: AS-35S
14. Body color	Black

BLOCK DIAGRAM



- ① – Color Tuner TU TEPJ5-02
Selects a desired radio wave, and changes it to the video IF signal.
- ② – Video IF Amp. Q200 2SC4238
Amplifies the video IF signal output from the tuner TU by 10 times (20dB).
- ③ – Video, Sound, FM Det., AGC IC200 M51348FP
Eliminates the carrier wave in the video IF signal, and picks up the video signal and the sound IF signal. Also the sound signal is picked up from the sound IF signal by FM detection.
- ④ – Audio Amp. IC900 TA7368F
Sound amplification.
- ⑤ – Chroma Circuit IC300 M51289FP
Generates the tricolor of red, green and blue from the video signal.
- ⑥ – OSC, A/D Converter, Display / Auto-tuning Control : IC700 MSM6525B02 GSK-64D
Converts the color signal into digital signal.
Also generates the clock pulse for the display, and controls the display.
- ⑦ – Tuning Voltage Generator IC400 MSC1169MS-K
Generates the tuning voltage from the tuning pulse (TU) output of ⑥.
- ⑧ – Display Voltage Generator Q800 ~ Q801 2SC2713, 2SD601A-Rxz
Generates the display voltages V0 ~ V4 from VEE1 and VCC7 outputs of the power supply.

CIRCUIT DESCRIPTIONS

Tuning Voltage Generator

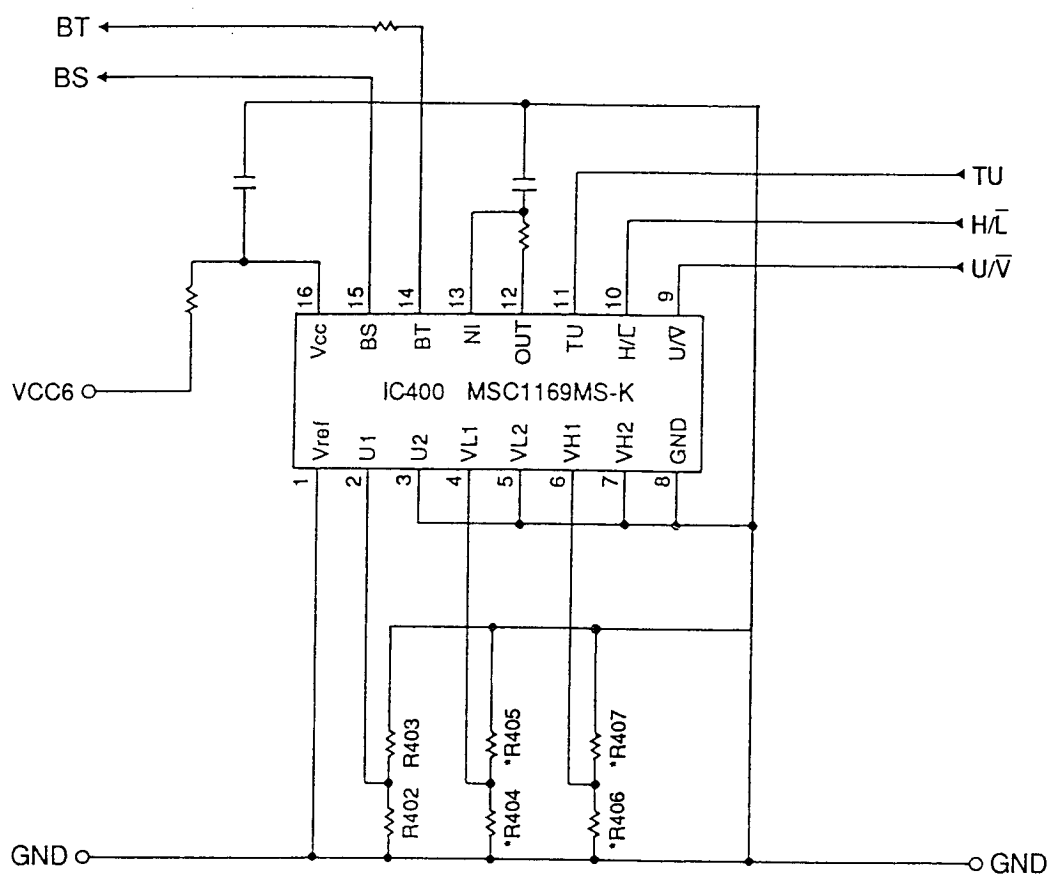


Fig. 1

* : TV470C and TV 470N only

This circuit generates the DC tuning voltage BT for selecting a channel from TU pulse being output from IC700.

IC400 has 3 circuits for converting pulses to voltages, selects one of VHF-L, VHF-H or UHF, and causes the tuning voltage to be output from the TU0 terminal (pin no.12). Fig. 2 and Table 1 show the conditions for selection.

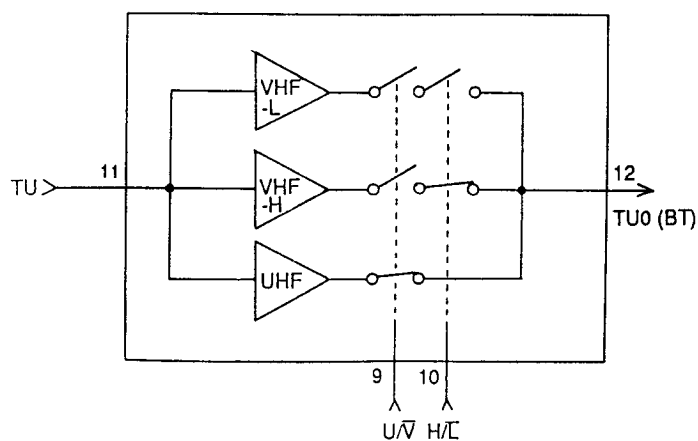


Fig. 2

INPUTS		Function
U/V	H/L	
L	L	VHF-L receiving
L	H	VHF-H receiving
H	L	UHF receiving
H	H	UHF receiving

Table - 1

Power Supply

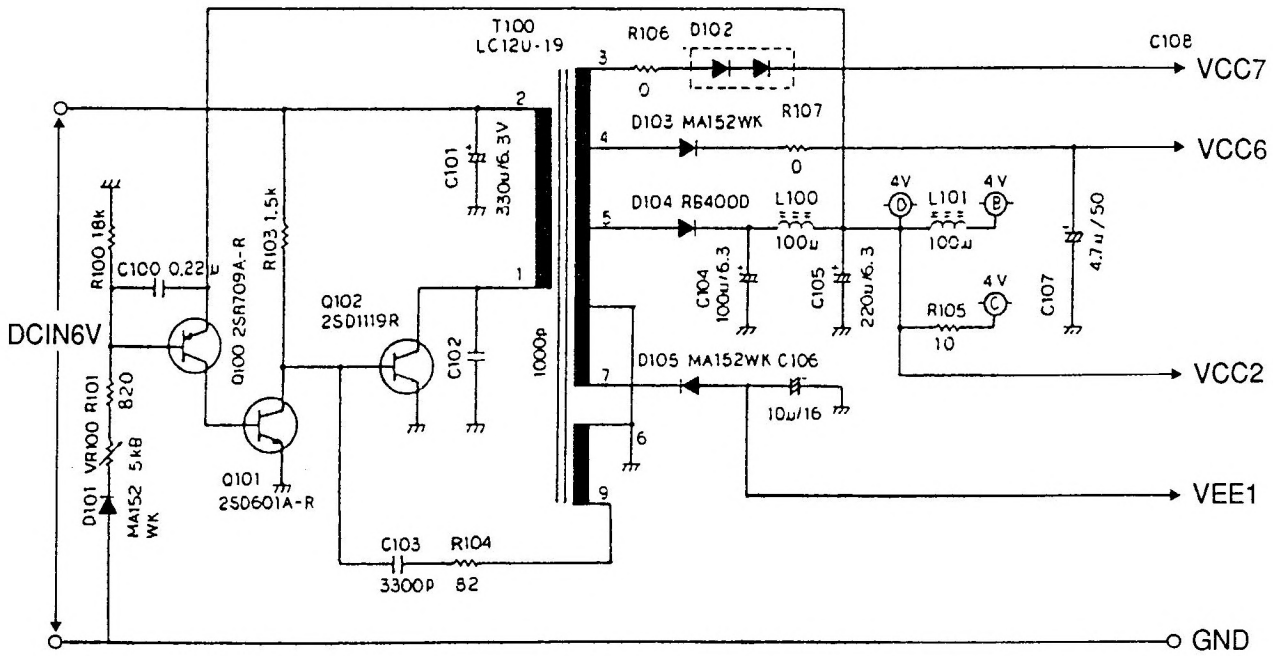


Fig. 3

The power supply consists of DC-DC converter, and causes the voltages to be output as shown in Table 2.

Name	Voltage	Function
VCC2	$3.95 \pm 0.02V$	Main voltage
VCC6	26.5 ~ 36.0V	Tuning voltage
VCC7	51.0 ~ 70.0V	Display voltage
VEE1	-6.0 ~ -7.6V	Display voltage

Table – 2

ADJUSTMENT

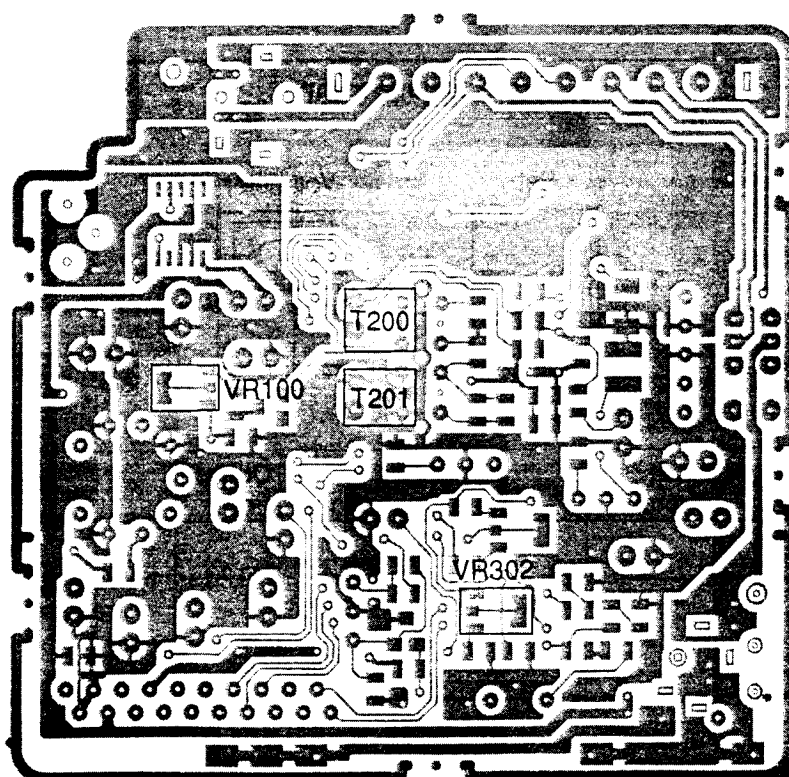
Linear PCB

1) Items to be adjusted:

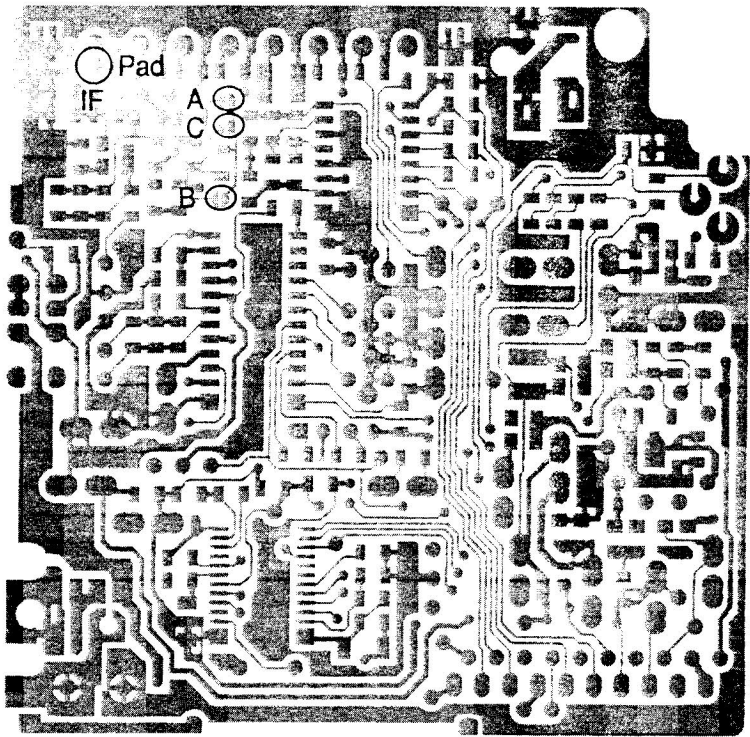
Item	Measuring Instrument
VCC2 voltage setting	Voltmeter
Video detection coil adj.	TV signal generator, Pattern generator, Oscilloscope, Low-pass filter
AFT coil adjustment	Sweep generator, Oscilloscope, Voltmeter
Contrast adjustment	TV signal generator, Pattern generator, Oscilloscope
AGC adjustment	TV signal generator, Pattern generator, IF levelmeter

2) Adjustment and Test Point Locations

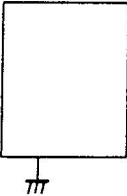
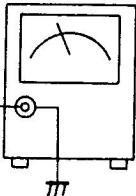
(TOP VIEW)



(BOTTOM VIEW)

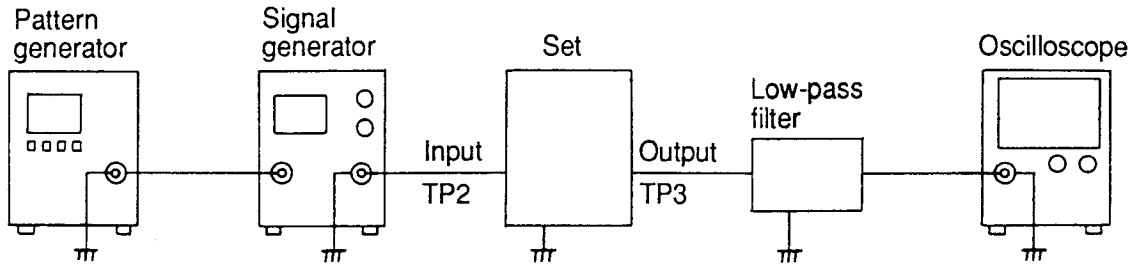


3) Equipment connection / Procedure

Vcc2 voltage setting						
Set  Voltmeter  Output TP1						
Input Connection	Input Point	Input Signal	Adjust	Output Connection	Output Point	Adjust for
—	—	—	VR100	Voltmeter	TP1	Adjust for $3.95 \pm 0.02\text{V}$ reading on voltmeter.

Video detection coil adjustment

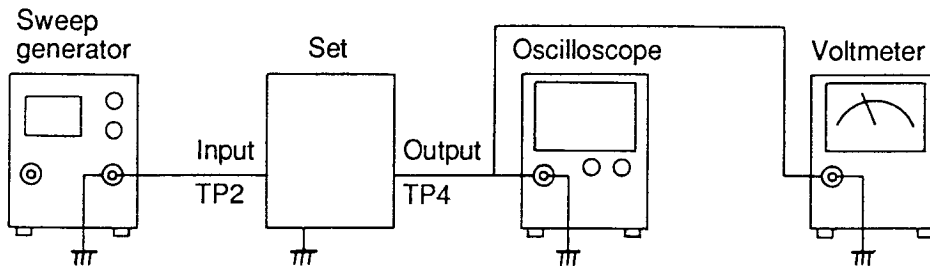
* Open soldering pad IF.



Input Connection	Input Point	Input Signal	Adjust	Output Connection	Output Point	Adjust for
Pattern generator Signal generator	TP2	Color bar 38.9MHz(TV-470C,N) 39.5MHz(TV-470D) $43 \pm 5\text{dB}\mu$	T201	Low-pass filter Oscilloscope	TP3	Adjust for DC level at minimum.

AFT coil adjustment

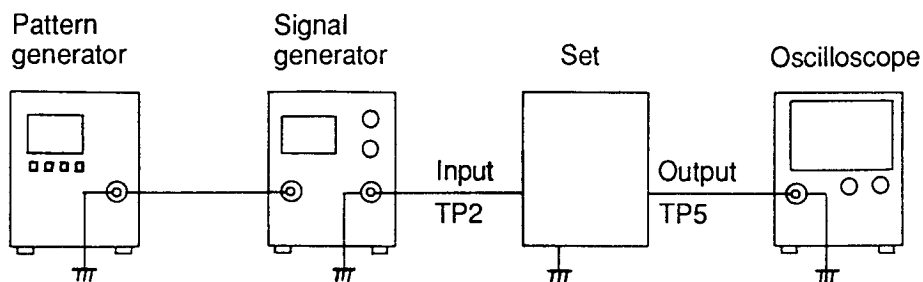
* Open soldering pad IF.



Sweep generator	TP2	38.9 $\pm$ 5MHz(Sweep): TV-470C,N 39.5 $\pm$ 5MHz(Sweep): TV-470D Marker: 38.9(TV470C,N) Marker: 39.5(TV-470D) 70dB μ	T200	Voltmeter Oscilloscope	TP4	Adjust for $1.7 \pm 0.2\text{V}$ reading on voltmeter. Confirm that the marker is at the middle of S-curve on oscilloscope.
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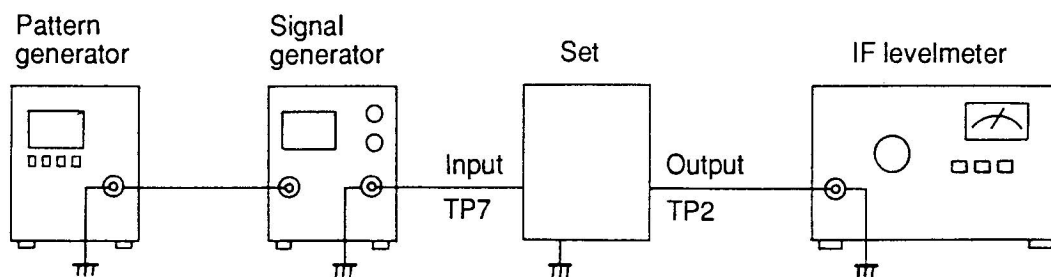
Contrast adjustment

* Open soldering pad IF.



Pattern generator Signal generator	TP2	Color bar 38.9MHz(TV-470C,N) 39.5MHz(TV-470D) 70dB μ	VR302	Oscilloscope	TP5	Adjust step form wave to read $0.7 \pm 0.05\text{ Vp-p}$.
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AGC adjustment



Input Connection	Input Point	Input Signal	Adjust	Output Connection	Output Point	Adjust for
Pattern generator TV signal generator	TP7	Color bar $65 \pm 5 \text{ dB}\mu$	Pads A/B/C	IF level meter	TP2	Make adjustment according to the next table with reading the IF levelmeter.

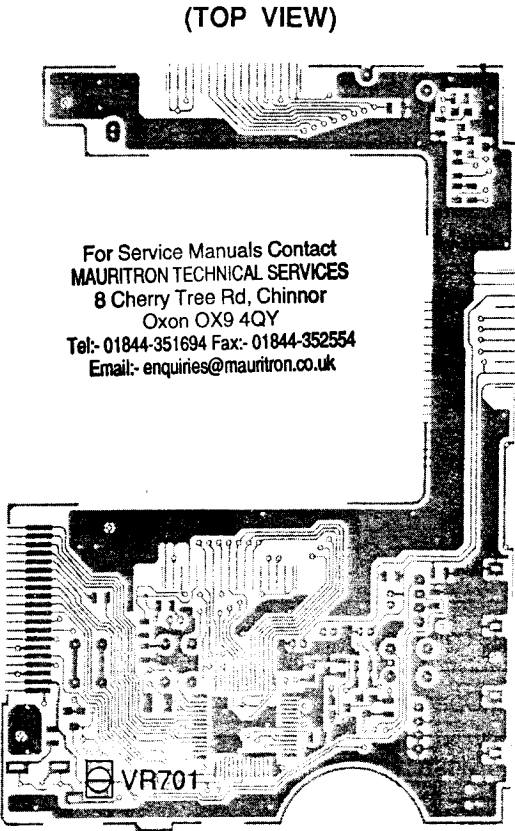
If IF levelmeter reading is:	Pads to be short-circuited.
79 ~ 85 dB μ	No Pad shorting required.
More than 85 dB μ	Pad A should be short-circuited.
Less than 79 dB μ	Pad B should be short-circuited.
If short-circuiting of pads B or C does not set the IF levelmeter within 79 ~ 85 dB μ	Pad C should be also short-circuited.

A/D PCB

1) Item to be adjusted:

Item	Measuring Instrument
Clock adjustment	Voltmeter

2) Adjustment and Test point locations:



3) Equipment connection / Procedure

Clock adjustment						
Set Voltmeter Output TP6						
Input Connection	Input Point	Input Signal	Adjust	Output Connection	Output Point	Adjust for
—	—	—	VR701	Voltmeter	TP6	Adjust for 1.85 ± 0.05V reading on voltmeter.

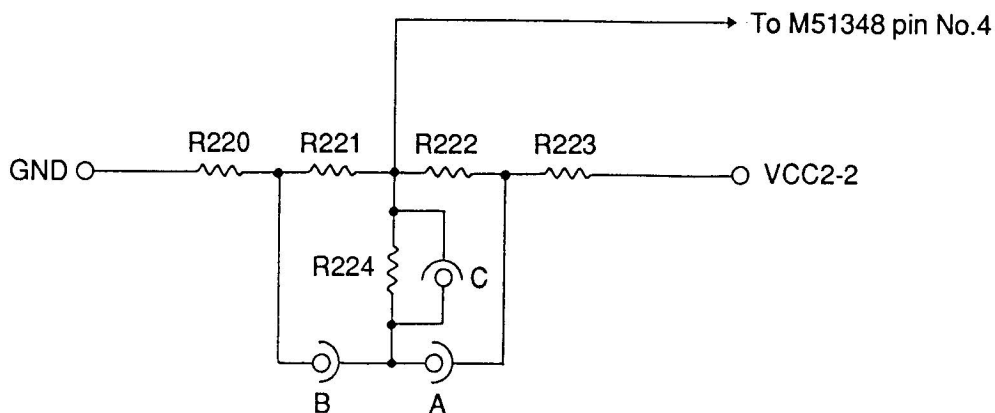
ADJUSTMENT (When appropriate measuring instruments are not available.)

Adjustment point	Adjustment	PCB
VCC 2 voltage	*O Make this adjustment whenever repairing. O Adjust VR100 so that VCC2 is $3.95 \pm 0.02V$	Linear
Video detection coil	*O Make this adjustment when sensitivity or receiving is poor. O Adjust T201 with watching the screen.	Linear
AFT coil	*O Make this adjustment when the auto-tuning does not stop. O Adjust T200 so that the auto-tuning stops.	Linear
Contrast	*O Make this adjustment when the contrast is not good. O Adjust VR302 with watching the screen.	Linear
AGC	*O Make this adjustment when no reception is possible at all or the sensitivity is extremely bad. O Adjust soldering pads A ~ C.	Linear
Clock pulse	*O Make this adjustment when no synchronization is gained. O Adjust VR701 with watching the screen.	A/D

(AGC Adjustment)

By closing or opening the adjustment pads A, B and C, adjust 'Tuner' output pin 2 voltage at 1.2V.

Adjustment pads	Pads condition	AGC voltage
A, B, C	Open	—————
B	Close	↘
B, C	Close	↘
A	Close	↗
A, C	Close	↗



TROUBLESHOOTING

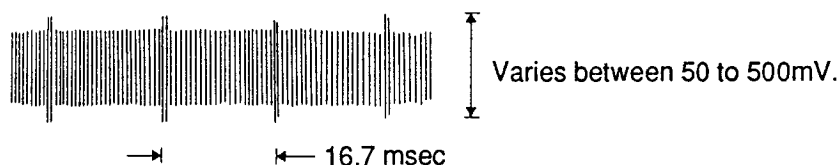
1. No receiving (The power supply works correctly, and each IC receives correct voltages.)

(1) Check the tuner voltage

Pin No.	Terminals	Voltages	Measuring conditions	Next step when NG
2	AGC	1.0 ~ 1.5	None	Go to (3)
3	BU	3.7	Measure the voltage with setting the selector SW to UHF	Replace SW100
4	BT	0.0 ~ 21.0	Same as above	Go to A-1
5 *TV-470C,N only	BS	21.0	When the indicator is at channel 1~3 ch of VHF.	Go to B-1
6 *TV-470C,N only	BV	3.7	Measure the voltage with setting the selector SW to VHF	Replace SW100
7	BM	3.7	None	Go to the step of "No voltage"

(2) Measure the collector waveforms of IF Amp. Q200

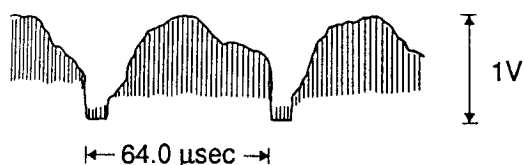
Check that the waveforms as below appear when the indicator does not stop.



If the waveforms does not appear: Replace the tuner.

(3) Check the waveforms at pin no.18 of IC200.

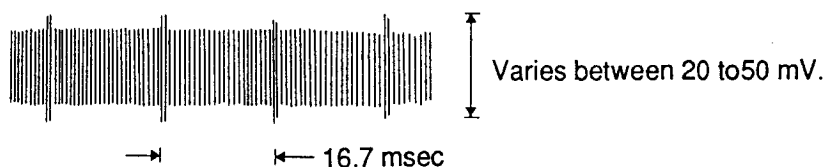
Check that the waveforms as below appears when the indicator passes the receiving channel.



When the waveforms appear: Go to (5).

(4) Measure the waveform at pin no.19 and 20 of IC200.

Check that the waveforms as below appear when the indicator passes the receiving channel.



If the waveforms do not appear: Replace component in order of C216, T201 and IC200.

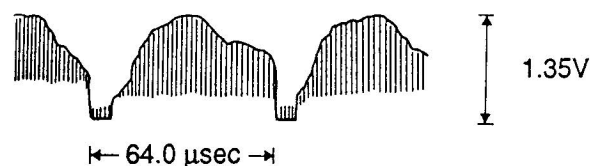
- (5) Check the voltage at pin no. 17 of IC200.
Check the voltage varies between about 0 to 4V when the indicator does not stop.

When the voltage varies: Go to (7).

- (6) Adjusting the transformer T200.
Mark the initial position, and turn to the right and the left slightly. At this condition, check that voltage amplitude varies at pin no. 17 of IC200.

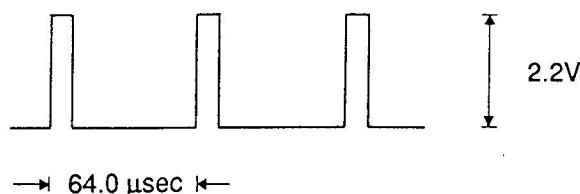
If the amplitude does not vary: Replace components in order of C213 to C215, T200 and IC200.

- (7) Measure the waveforms at pin no. 10 to 12 of IC300.
Check the waveforms as below appear when the indicator passes the receiving channel.



When the waveforms appear: Go to (9).

- (8) Measure the waveforms at pin no. 4 of IC300.
Check the waveforms as below appear when the indicator passes the receiving channel.

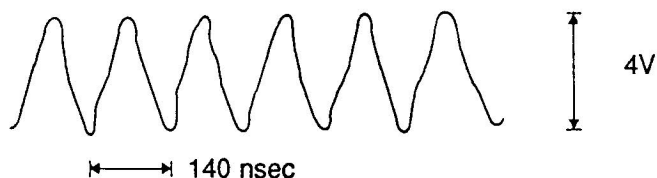


When the waveforms appear: Go to (9).

- (9) Check that signals C-S, AFT and R-G-B from the Linear PCB go to pin no. 19, 29 and 45-47 of IC700 respectively.

If IC700 does not receive signals: Check a signal line cutting or poor soldering on all terminals of IC700.

- (10) Measure the waveforms at pin no. 16 of IC700.
Check the waveforms as below appear.



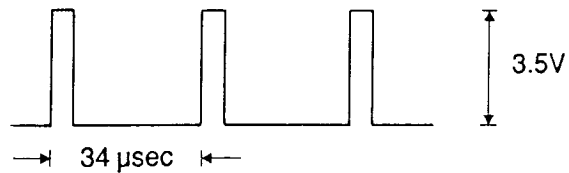
If no waveforms appear: Check poor soldering on OSC block or replace components L701, D700, D701, or IC700 etc.

(11) Measure the voltage pin no. 27 and 28 of IC700.

- 1) Check solder bridge on R717 or R718, or replace components.
- 2) Replace the Tuning button KEY SW200 or SW201 or SW202 or IC700.

A-1 Measure the waveforms at pin no. 11 of IC400.

Check that the waveforms as below appear when the indicator does not stop.



If the waveforms do not appear, unsolder pin no. 10 of IC400, and check the waveform at the solder pad again.

- 1) When the waveforms appear: Replace IC400.
- 2) If the waveform do not appear: Check poor soldering on IC700 or replace it.

A-2 Remove R201, and check the voltage at pin no. 14 of IC400 varies between 0 to 30V.

When the voltage varies: Replace the tuner.

If does not vary: Replace IC400.

B-1 Measure the voltage at pin no. 10 of IC400.

Check that the voltage is GND level when the indicator is between 2 to 6 channel.

Check that the voltage is 4 volt level when the indicator is between 7 to 13 channel.

If the voltage is not in above voltage level, unsolder pin no. 10 of IC400, and measure the voltage at the solder pad again.

- 1) When the voltage appears: Replace IC400.
- 2) If the voltage does not appear: Check soldering condition of IC700, or replace IC700.

B-2 Measure the voltage at pin no. 15 of IC400.

Check that the voltage is 22V when the indicator is between 2 to 6 channel.

Check that the voltage is GND when the indicator is between 7 to 13 channel.

- 1) If the voltage appears: Replace the tuner.
- 2) If the voltage does not appear: Replace IC400.

2. No voltage (Turn off the power switch immediately if a desired voltage does not appear.)

- (1) Check that each voltage appears when the power line to the FL trans unit is cut.

No voltage appears: Defective back-light.

- (2) Check conductivity of D100.

No conductivity: Replace D100.

- (3) Check conductivity between 1 and 2, 6 and 9, 3 and 4, 3 and 5, and 3 and 7 without supplying power voltage.

If any does not have conductivity: Replace T100.

(4) Check that the voltage at pin no. 2 of T100 is 6V.

If the voltage does not appear, unsolder pin no. 1 and 2 of T100, and measure the voltage at solder pad of pin 2 side.

1) If no voltage appears: Replace SW100 or check the line from SW100 to pin no. 2 of T100.

2) When the voltage appears: Solder pin no.1 and 2 of T100, and go to (5).

(5) Unsolder pin no. 3, 4, 5 and 7 of T100, and check the voltage again.

If no voltage appears: Replace all of Q100 ~ Q102 and D101.

(6) Solder pin no. 3 of T100, and measure the voltage at pin no. 2.

If no voltage appears: Turn off the power, and check the conductivity of D102.

1) If it is not normal: Replace D102.

2) If it is normal: Replace IC400.

(7) Solder pin no.7 of T100, and measure the voltage at pin no. 2.

If the voltage does not appear: Turn off the power, and check the conductivity of D105.

1) If not normal: Replace D105.

2) If normal: Replace Q800 ~ Q802

(8) Solder pin no.5 of T100 and check the voltage at pin no.2.

If no voltage appears: Turn off the power, and check the conductivity of D104.

If not normal: Replace D104.

(9) Solder pin no.4 of T100 and check the voltage at pin no.2.

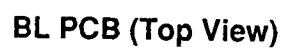
If no voltage appears: Turn off the power, and check the conductivity of D103.

If not normal: Replace D103.

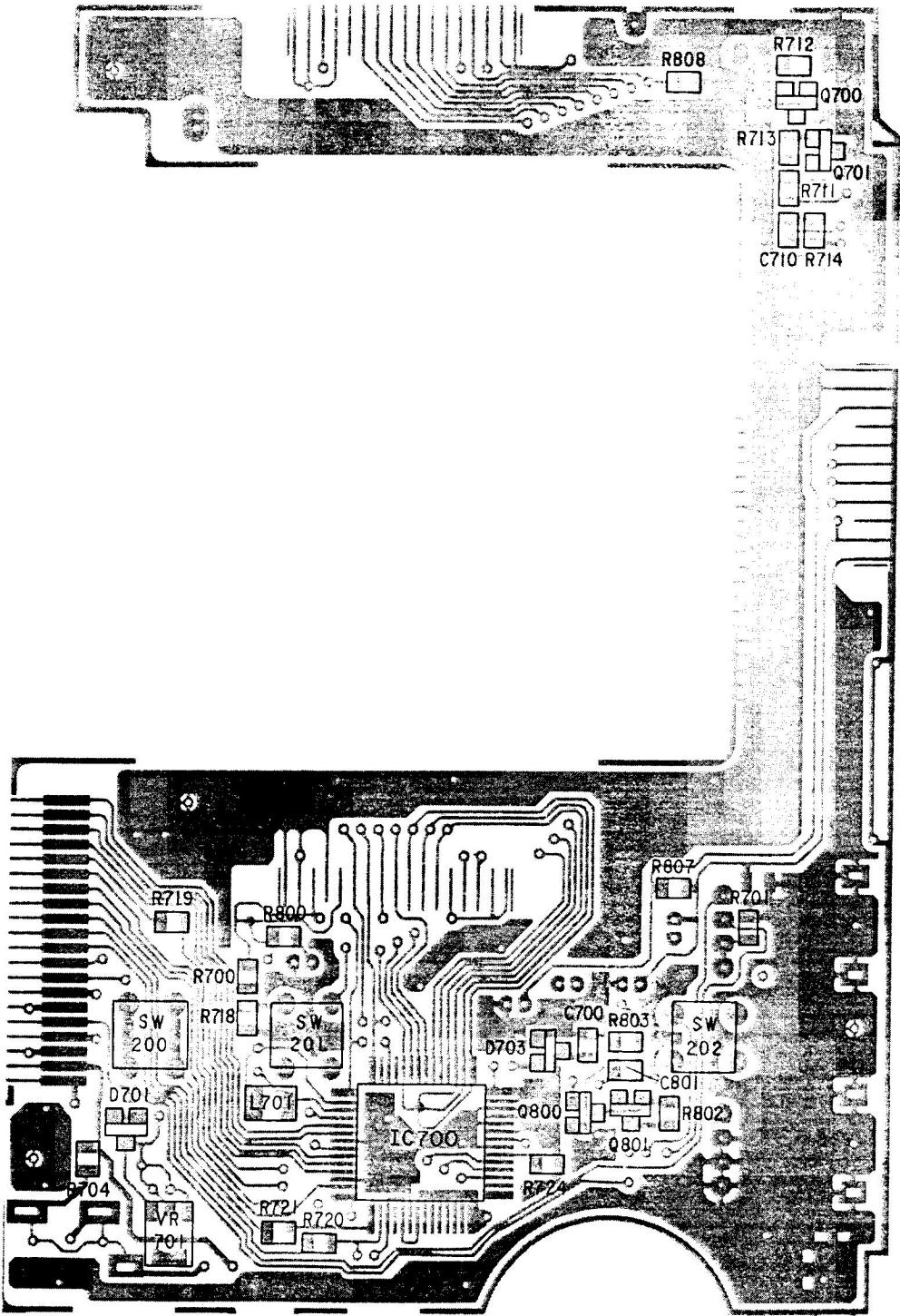
(10) Unsolder L100, and measure the voltage at pin no.2.

When the voltage appears: Replace components in order of the tuner IC300 and IC200.

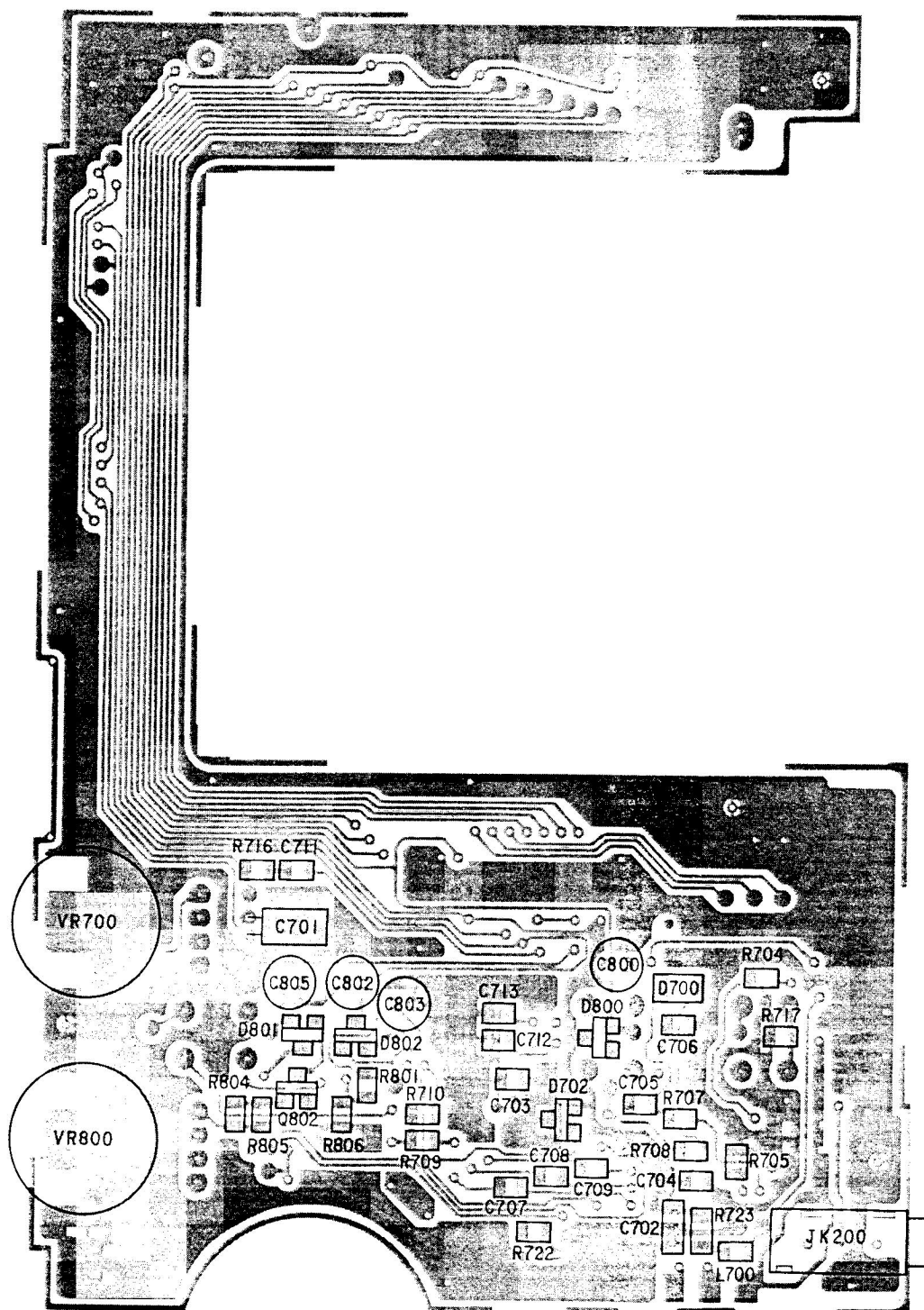
Linear PCB (Top View)



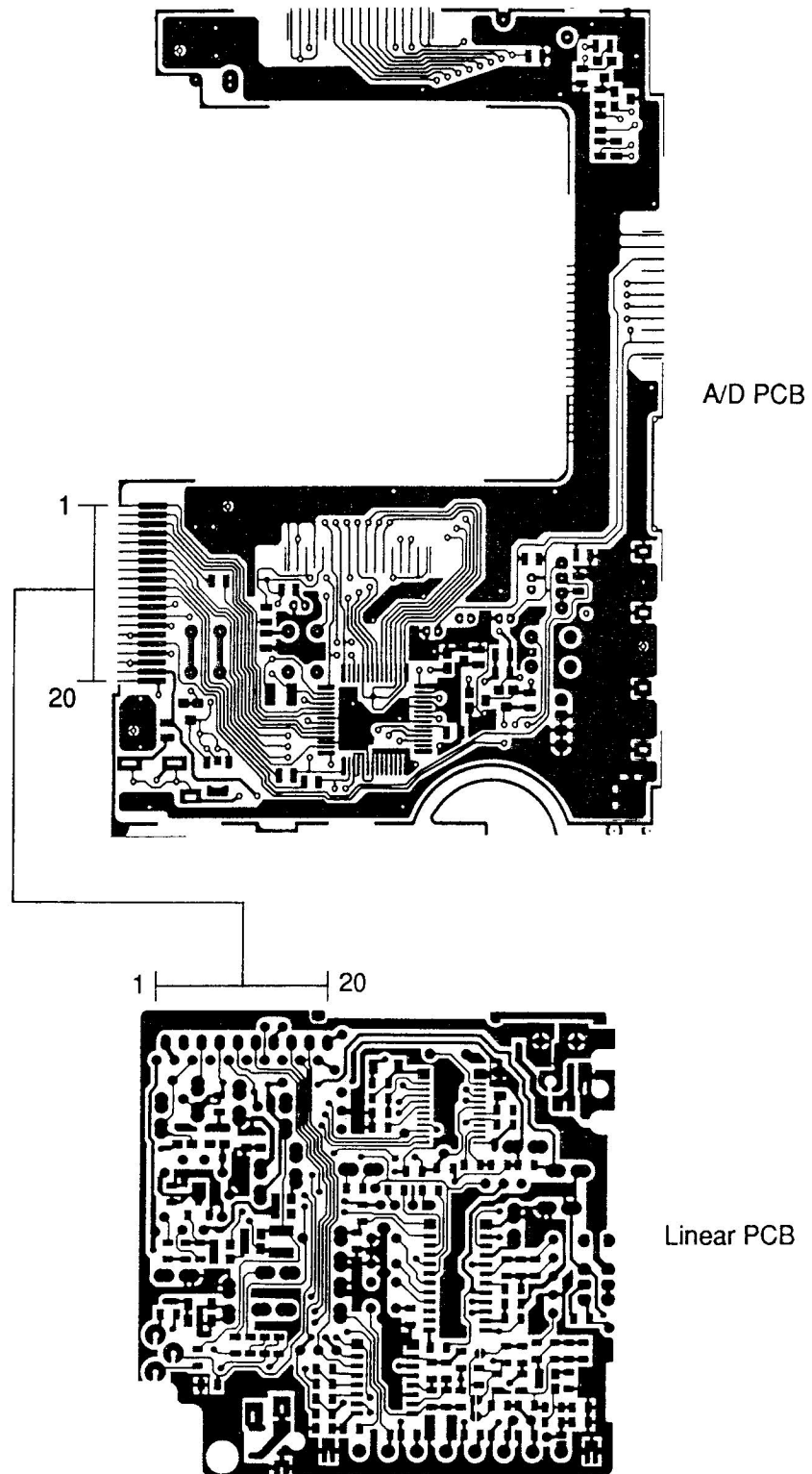
A/D PCB (Top View)



A/D PCB (Bottom View)



WIRING DIAGRAM



ELECTRICAL PARTS LIST

Linear PCB No. 1

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
Capacitor								
O*C100	2897 0931	Chip	GR42-6Y5V224Z16PT	1	1	1		C
O*C101	2805 9428	Electrolytic	ECE-A0JKA331I	1	1	1		C
C102	2892 0016	Chip	GR40W5R102K50PT	1	1	1		C
C103	2897 0259	Chip	GR40W5R332K50PT	1	1	1		C
C104	2805 8777	Electrolytic	6.3RC2S-100-T36	1	1	1		C
O*C105	2805 9421	Electrolytic	ECE-A0JKA221I	1	1	1		C
O*C106	2805 9540	Electrolytic	ECE-A1CKS100I	1	1	1		C
O*C107	2805 8679	Electrolytic	ECE-A1HKA4R7I	1	1	1		C
O*C108	2805 9414	Electrolytic	100RC2-1-T36	1	1	1		C
C109	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
C110	2801 9373	Electrolytic	6.3RC347-T36	0	0	1		C
C200	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
O*C201	2805 8630	Electrolytic	ECE-A0JKA470I	1	1	1		C
C202	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
O*C203	2897 0994	Chip	GR42-6Y5V334Z50PT	1	1	0		C
C203	2897 0924	Chip	GR42-6W5R823K50PT	0	0	1		C
C204	2892 0059	Chip	GR40Y5V103Z50PT	1	1	0		C
C205	2892 0059	Chip	GR40Y5V103Z50PT	1	1	0		C
C206	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
C207	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
C208	2897 0245	Chip	GR40CH180J50PT	1	1	0		C
C208	2897 0350	Chip	GR40CH160J50PT	0	0	1		C
C209	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
C211	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
C212	2897 0539	Chip	GR40W5R223K50PT	1	1	1		C
C213	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
C214	2892 0890	Chip	GR40PH560J50PT	1	1	1		C
O*C215	2892 0491	Chip	GR40CH020C50PT	1	1	0		C
C215	2897 0133	Chip	GR40CH0R5C50PT	0	0	1		C
C216	2892 0890	Chip	GR40PH560J50PT	1	1	1		C
C217	2892 0407	Chip	GR40CH270J50PT	1	1	1		C
O*C219	2895 0595	Chip tantalum	ECST0JY225R	1	1	1		C
C220	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
O*C221	2805 9547	Electrolytic	ECE-A0JKS470I	1	1	1		C
C222	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
O*C223	2805 8630	Electrolytic	ECE-A0JKA470I	1	1	1		C
C224	2892 0844	Chip	GR42-6Y5V474Z16PT	1	1	1		C
C225	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
O*C226	2805 8665	Electrolytic	ECE-A1CKA100I	1	1	1		C
O*C300	2805 9547	Electrolytic	ECE-A0JKS470I	1	1	1		C
C301	2892 0423	Chip	GR40CH680J50PT	1	1	1		C
C302	2897 0245	Chip	GR40CH180J50PT	1	1	1		C
O*C303	2897 0973	Chip	GR40W5R683K25PT	1	1	1		C
C304	2892 0814	Chip	GR40Y5V683Z25PT	1	1	1		C
C305	2897 0112	Chip	GR40W5R562K50PT	1	1	1		C
C306	2895 0217	Chip tantalum	ECST0GY475R	1	1	0		C
C306	2895 1309	Chip tantalum	ECST1CY684R	0	0	1		C
O*C307	2845 1344	Chip	GR40W5R471K50PT	1	1	0		C
C307	2892 0377	Chip	GR40CH331J50PT	0	0	1		C
O*C308	2805 8714	Electrolytic	ECE-A1CKA100I	1	1	1		C
C309	2892 0083	Chip	GR40W5R103K50PT	1	1	1		C
C400	2897 0021	Chip	GR40Y5V683Z50PT	1	1	1		C
C401	2897 0630	Chip	GR40W5R333K50PT	1	1	1		C
C900	2897 0833	Chip	GR40Y5V153Z25PT	1	1	0		C
C900	2897 0539	Chip	GR40W5R223K50PT	0	0	1		C
C901	2897 0546	Chip	GR40W5R393K25PT	1	1	1		C
O*C902	2805 8630	Electrolytic	ECE-A0JKA470I	1	1	1		C

Linear PCB No. 2

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
O*C903	2805 8623	Electrolytic	ECE-A0JKA101I	1	1	1		C
O*C904	2805 8630	Electrolytic	ECE-A0JKA470I	1	1	1		C
Diodes								
D100	2390 1190	Diode	ERA15-01Y	1	1	1		C
D101	2390 1176	Chip	MA152WK-(TX)	1	1	1		C
O*D102	2390 1302	Chip	MA153A-(TX)	1	1	1		C
D103	2390 1176	Chip	MA152WK-(TX)	1	1	1		C
O*D104	2390 1169	Chip schottoky	RB400DT-146	1	1	1		C
D105	2390 1176	Chip	MA152WK-(TX)	1	1	1		C
Filters and Traps								
F200	3025 0189	SAW filter	SAF38.9MZ60Z	1	1	0		C
F200	3025 0210	SAW filter	SAF39.5MZ60Z	0	0	1		C
F201	3851 0959	Ceramic discriminator	CDSL5.5MC30A	1	1	0		C
F201	3851 0966	Ceramic discriminator	CDSL6.0MC30A	0	0	1		C
F202	3025 0511	SIF filter	SFSL5.5MD12	1	1	0		C
F202	3025 0525	SIF filter	SFSL6.0MD12	0	0	1		C
F203	3850 1372	SIF trap	TPS5.5MB	1	1	0		C
F203	3851 0553	SIF trap	TPS6.0MB	0	0	1		C
ICs								
O*IC200	2114 1827	Linear	M51348FP-T1	1	1	1		B
O*IC300	2114 2135	Linear	M51289FP-T1	1	1	1		B
IC400	2114 0182	Linear	MSC1169MS-K	1	1	1		B
IC900	2114 1694	Linear	TA7368F-T1	1	1	1		B
Inductors								
O*L100	3841 0777	Chip	EL0405RA-101K-2	1	1	1		C
O*L101	3841 0777	Chip	EL0405RA-101K-2	1	1	1		C
L200	3013 0686	Chip	MLF2012DR82K-TP	1	1	1		C
L202	3013 0693	Chip	MLF2012C150K-TP	1	1	0		C
L202	3013 0749	Chip	MLF2012E120K-TP	0	0	1		C
Transistors								
Q100	2210 8026	Chip	2SB709A-R(TX)	1	1	1		C
Q101	2230 7011	Chip	2SD601A-R(TX)	1	1	1		C
Q102	2253 0308	Chip	2SD1119-R(TX)	1	1	1		C
Q200	2252 0707	Chip	2SC4238-(TX)	1	1	1		C
Q300	2210 8026	Chip	2SB709A-R(TX)	1	1	1		C
Resistors								
R100	2791 1684	Chip	ERJ-6GEYJ183V	1	1	1		C
R101	2797 0014	Chip	ERJ-6GEYJ821V	1	1	1		C
R103	2791 0712	Chip	ERJ-6GEYJ152V	1	1	1		C
R104	2791 2117	Chip	ERJ-6GEYJ820V	1	1	1		C
R105	2791 1617	Chip	ERJ-6GEYJ100V	1	1	1		C
R106	2792 0110	Chip jumper	ERJ-6GEY0R00V	1	1	1		C
R107	2792 0110	Chip jumper	ERJ-6GEY0R00V	1	1	1		C
R108	2792 0110	Chip jumper	ERJ-6GEY0R00V	0	0	1		C
R200	2797 1127	Chip	ERJ-6GEYK475V	1	1	0		C
R200	2797 1015	Chip	ERJ-6GEYK225V	0	0	1		C
R201	2791 0750	Chip	ERJ-6GEYJ223V	1	1	1		C
R202	2791 2117	Chip	ERJ-6GEYJ820V	1	1	0		C
R202	2791 0572	Chip	ERJ-6GEYJ101V	0	0	1		C
R203	2791 0712	Chip	ERJ-6GEYJ152V	1	1	0		C
R203	2791 0734	Chip	ERJ-6GEYJ272V	0	0	1		C
R204	2791 0580	Chip	ERJ-6GEYJ392V	1	1	0		C
R204	2791 2095	Chip	ERJ-6GEYJ682V	0	0	1		C
O*R205	2797 2079	Chip	ERJ-6GEYJ120V	1	1	1		C
R206	2791 0831	Chip	ERJ-6GEYJ681V	1	1	1		C
R207	2791 2117	Chip	ERJ-6GEYJ820V	1	1	0		C
R207	2791 1617	Chip	ERJ-6GEYJ100V	0	0	1		C
R209	2791 0615	Chip	ERJ-6GEYJ154V	1	1	1		C

Linear PCB No. 3

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
R210	2791 2044	Chip	ERJ-6GEYJ124V	1	1	1		C
R212	2791 0734	Chip	ERJ-6GEYJ272V	1	1	0		C
R213	2791 1131	Chip	ERJ-6GEYJ271V	1	1	1		C
R214	2791 2176	Chip	ERJ-6GEYJ471V	1	1	1		C
R215	2791 0572	Chip	ERJ-6GEYJ101V	1	1	1		C
R217	2791 0720	Chip	ERJ-6GEYJ222V	1	1	1		C
R218	2791 0313	Chip	ERJ-6GEYJ103V	1	1	1		C
R219	2791 0305	Chip	ERJ-6GEYJ472V	1	1	1		C
O*R220	2791 2114	Chip	ERJ-6GEYF333V	1	1	0		C
R220	2797 1456	Chip	ERJ-6GEYF623V	0	0	1		
R221	2791 0580	Chip	ERJ-6GEYJ392V	1	1	0		C
R221	2791 2095	Chip	ERJ-6GEYJ682V	0	0	1		C
R222	2791 0815	Chip	ERJ-6GEYJ102V	1	1	0		C
R222	2791 1170	Chip	ERJ-6GEYJ182V	0	0	1		C
O*R223	2797 1484	Chip	ERJ-6GEYF822V	1	1	0		C
R223	2791 1595	Chip	ERJ-6GEYF153V	0	0	1		C
R224	2791 0712	Chip	ERJ-6GEYJ152V	1	1	0		C
R224	2791 0742	Chip	ERJ-6GEYJ332V	0	0	1		C
R225	2791 0696	Chip	ERJ-6GEYJ470V	1	1	1		C
R226	2791 1603	Chip	ERJ-6GEYJ221V	1	1	0		C
R226	2791 1420	Chip	ERJ-6GEYJ331V	0	0	1		C
R227	2791 0815	Chip	ERJ-6GEYJ102V	1	1	0		C
R227	2791 0720	Chip	ERJ-6GEYJ222V	0	0	1		C
R300	2792 0110	Chip jumper	ERJ-6GEY0R00V	1	1	1		C
R301	2791 2079	Chip	ERJ-6GEYJ562V	1	1	1		C
R302	2791 0720	Chip	ERJ-6GEYJ222V	1	1	1		C
R303	2791 2176	Chip	ERJ-6GEYJ471V	1	1	1		C
R304	2791 0607	Chip	ERJ-6GEYJ333V	1	1	1		C
R305	2792 0110	Chip jumper	ERJ-6GEY0R00V	1	1	1		C
R307	2792 0110	Chip jumper	ERJ-6GEY0R00V	1	1	1		C
O*R308	2797 1925	Chip	ERJ-8GEYK335V	1	1	1		C
R309	2791 0607	Chip	ERJ-6GEYJ333V	1	1	1		C
R310	2791 0815	Chip	ERJ-6GEYJ102V	1	1	1		C
R311	2791 2044	Chip	ERJ-6GEYJ124V	1	1	0		C
R311	2791 0769	Chip	ERJ-6GEYJ563V	0	0	1		C
R312	2791 0831	Chip	ERJ-6GEYJ681V	1	1	0		C
R312	2791 0720	Chip	ERJ-6GEYJ222V	0	0	1		C
R313	2791 1579	Chip	ERJ-6GEYJ474V	1	1	1		C
R315	2791 1170	Chip	ERJ-6GEYJ182V	1	1	0		C
R315	2791 2079	Chip	ERJ-6GEYJ562V	0	0	1		C
R320	2791 1390	Chip	ERJ-6GEYJ473V	1	1	1		C
R400	2791 1420	Chip	ERJ-6GEYJ331V	1	1	1		C
R401	2791 1579	Chip	ERJ-6GEYJ474V	1	1	1		C
R402	2791 1390	Chip	ERJ-6GEYJ473V	1	1	1		C
R403	2791 1919	Chip	ERJ-6GEYJ274V	1	1	0		C
R403	2791 1901	Chip	ERJ-6GEYJ184V	0	0	1		C
R404	2791 0769	Chip	ERJ-6GEYJ563V	1	1	0		C
R405	2791 0777	Chip	ERJ-6GEYJ104V	1	1	0		C
R406	2791 0769	Chip	ERJ-6GEYJ563V	1	1	0		C
R407	2791 0777	Chip	ERJ-6GEYJ104V	1	1	0		C
R900	2791 0305	Chip	ERJ-6GEYJ472V	1	1	0		C
R900	2791 0580	Chip	ERJ-6GEYJ392V	0	0	1		C
R902	2791 0823	Chip	ERJ-8GEYJ220V	1	1	1		C
R903	2791 0823	Chip	ERJ-8GEYJ220V	1	1	1		C
R904	2791 0696	Chip	ERJ-6GEYJ470V	1	1	0		C
R904	2792 0110	Chip jumper	ERJ-6GEY0R00V	0	0	1		C
Coils and Converter								
O*T100	3065 0336	DC-DC Converter	LC12U-20	1	1	0		C

Linear PCB No. 4

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
O*T100	3065 0322	DC-DC Converter	LC12U-19	0	0	1		C
T200	3841 0070	Coil	5KAC-03A	1	1	1		C
T201	3841 0070	Coil	5KVC-03A	1	1	1		C
Variable Resistors								
VR100	2775 0770	Chip	EVM-1QSW30B53	1	1	1		C
O*VR300	2775 0966	Semi-fixed resistor	EVM-1QSW30B14	1	1	1		C
VR301	2775 0644	Semi-fixed resistor	H0614D-10KB	1	1	1		C
O*VR302	2775 0966	Volume	EVM-1QSW30B14	1	1	1		C
Miscellaneous Electrical Parts								
O*TU	1013 5518	Tuner	TEPE5-01	1	1	0		C
O*TU	1013 5525	Tuner	TEPB5-02	0	0	1		C
O*SW100	3412 0798	Switch	ESD-11H231	1	1	1		C
JK100	3501 3766	Jack	HSJ1417-01-010	1	1	1		C
JK101	3501 0994	Jack	HEC1781-01	1	1	1		C
H300	2590 0651	Crystal oscillator	HC-49U-C	1	1	1		C
O*CN100	3501 5432	Connector	IL-FPC-20S-S1T1	1	1	1		C

A/D PCB No. 1

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
Capacitors								
C700	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
O*C701	2805 9491	Electrolytic	6.3RC3-10S-G6	1	1	1		C
C702	2895 0189	Chip tantalum	ECST0JY335R	1	1	1		C
C703	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
C704	2892 0237	Chip	GR40W5R222K50PT	1	1	1		C
C705	2892 0059	Chip	GR40Y5V103Z50PT	1	1	1		C
C706	2892 0903	Chip	GR40UJ270J50PT	1	1	1		C
C707	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
C708	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
C709	2892 0040	Chip	GR40Y5V104Z25PT	1	1	1		C
C710	2892 0016	Chip	GR40W5R102K50PT	1	1	1		C
C711	2892 0016	Chip	GR40W5R102K50PT	1	1	1		C
C712	2897 0245	Chip	GR40CH180J50PT	1	1	1		C
C713	2897 0245	Chip	GR40CH180J50PT	1	1	1		C
O*C800	2800 9973	Electrolytic	ECE-A0JKA470	1	1	1		C
O*C801	2897 0581	Chip	GR40CH100J50PT	1	1	1		C
O*C802	2805 9372	Electrolytic	ECE-A1HKA010	1	1	1		C
O*C803	2805 9435	Electrolytic	ECE-A1HKA2R2	1	1	1		C
O*C805	2805 9512	Electrolytic	ECE-A1HKA100	1	1	1		C
Diodes								
O*D700	2390 1358	Chip	MA329-(TX)	1	1	1		C
D701	2360 0854	Chip	MA3100-M(TX)	1	1	1		C
D702	2390 1253	Chip	MA152WA-(TX)	1	1	1		C
D703	2390 1253	Chip	MA152WA-(TX)	1	1	1		C
O*D800	2360 1652	Chip	MA3075-H(TX)	1	1	1		C
D801	2390 1253	Chip	MA152WA-(TX)	1	1	1		C
D802	2390 0469	Chip	MA157A-(TX)	1	1	1		C
IC								
O*IC700	2011 0742	LSI	MSM6525B02GSK-640D	1	1	1		B
Inductors								
L700	3013 0868	Chip	BLM21A05PT	1	1	1		C
L701	3013 0889	Chip	NL322522-270J-TP	1	1	1		C
Transistors								
Q700	2230 7011	Chip	2SD601A-R(TX)	1	1	1		C
Q701	2210 8026	Chip	2SB709A-R(TX)	1	1	1		C
Q800	2230 7011	Chip	2SD601A-R(TX)	1	1	1		C
O*Q801	2252 0798	Chip	2SC2713(TE85L)	1	1	1		C
Q802	2230 7011	Chip	2SD601A-R(TX)	1	1	1		C
Resistors								
R700	2791 2109	Chip	ERJ-6GEYJ393V	1	1	1		C
R701	2791 0742	Chip	ERJ-6GEYJ332V	1	1	1		C
R704	2791 0696	Chip	ERJ-6GEYJ470V	1	1	1		C
R705	2791 0866	Chip	ERJ-6GEYJ334V	1	1	1		C
R707	2791 0777	Chip	ERJ-6GEYJ104V	1	1	1		C
R708	2791 2079	Chip	ERJ-6GEYJ562V	1	1	1		C
O*R709	2797 1624	Chip	ERJ-6GEYG102V	1	1	1		C
O*R710	2797 1974	Chip	ERJ-6GEYG621V	1	1	1		C
R711	2791 0750	Chip	ERJ-6GEYJ223V	1	1	1		C
R712	2791 1633	Chip	ERJ-6GEYJ123V	1	1	1		C
R713	2791 2079	Chip	ERJ-6GEYJ562V	1	1	1		C
R714	2791 0599	Chip	ERJ-6GEYJ822V	1	1	1		C
R716	2791 0599	Chip	ERJ-6GEYJ822V	1	1	1		C
R717	2791 2109	Chip	ERJ-6GEYJ393V	1	1	1		C
R718	2791 1633	Chip	ERJ-6GEYJ123V	1	1	1		C
R719	2791 1390	Chip	ERJ-6GEYJ473V	1	1	1		C
R720	2791 2141	Chip	ERJ-6GEYJ273V	1	1	1		C
R721	2791 1390	Chip	ERJ-6GEYJ473V	1	1	1		C

A/D PCB No. 2

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
R722	2797 0028	Chip	ERJ-6GEYJ683V	1	1	1		C
O*R723	2797 1967	Chip	ERJ-8GEYJ6R8V	1	1	1		C
R724	2797 0777	Chip	ERJ-6GEYJ121V	1	1	1		C
R800	2791 0815	Chip	ERJ-6GEYJ102V	1	1	1		C
R801	2791 0607	Chip	ERJ-6GEYJ333V	1	1	1		C
R802	2791 2052	Chip	ERJ-6GEYJ224V	1	1	1		C
O*R803	2797 1960	Chip	RR1220P-274-D	1	1	1		C
O*R804	2797 1953	Chip	RR1220P-303-D	1	1	1		C
R805	2797 0672	Chip	ERJ-6GEYJ684V	1	1	1		C
R806	2791 0750	Chip	ERJ-6GEYJ223V	1	1	1		C
R807	2797 1127	Chip	ERJ-6GEYK475V	1	1	1		C
R808	2791 1390	Chip	ERJ-6GEYJ473V	1	1	1		C
Variable Resistors								
O*VR700	2765 0616	Volume	RK09H11T-10KB	1	1	1		C
VR701	2775 0784	Semi fixed resistor	EVM-1QSW30B55	1	1	1		C
O*VR800	2765 1127	Volume	RK09H11T-100KC	1	1	1		C
Miscellaneous electrical parts								
O*JK200	3501 5439	Jack	HSJ1456-01-210	1	1	1		C
SW200	3412 0119	Switch	EVQ-QS204B	1	1	1		C
SW201	3412 0119	Switch	EVQ-QS204B	1	1	1		C
SW202	3412 0119	Switch	EVQ-QS204B	1	1	1		C

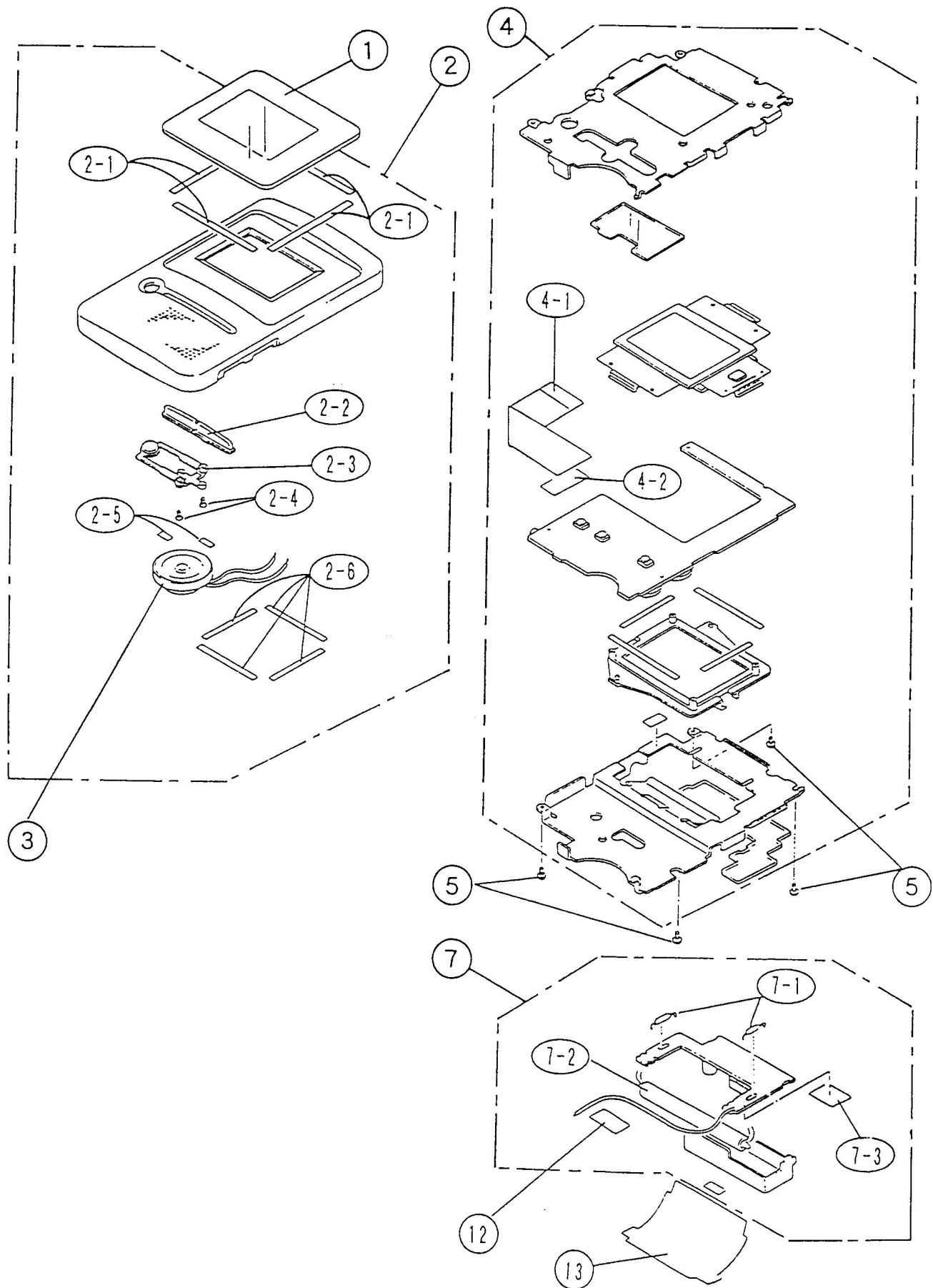
BL PCB

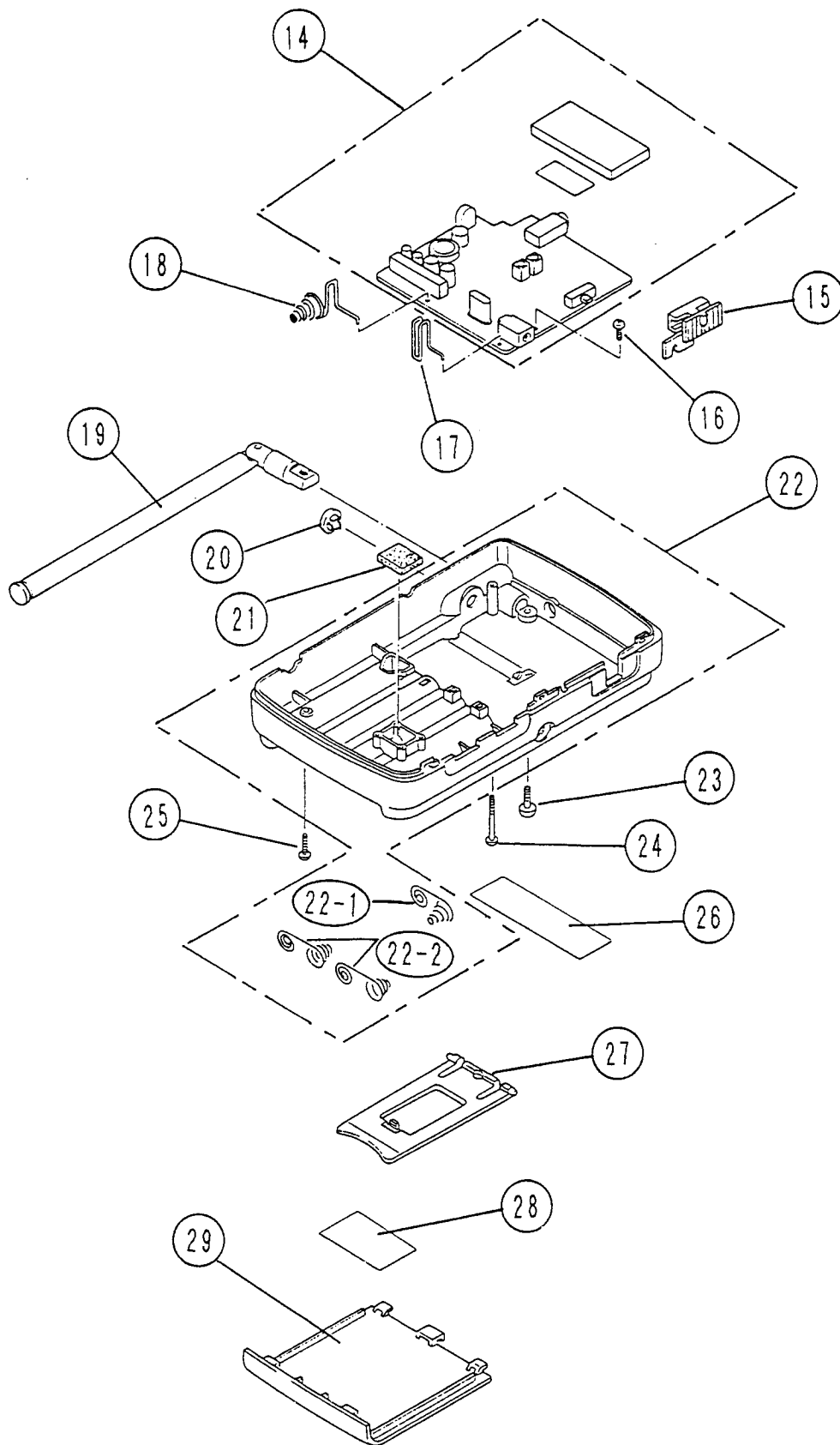
item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
Capacitors								
C604	2825 0301	TF	ECQ-V1H184JZ	1	1	1		C
C606	2813 1743	Ceramic	DE0905SL181J2K	1	1	1		C
Coil								
L600	3013 0756	Choke coil	RCH-875-101K	1	1	1		C
Transistors								
Q600	2253 0287	Transistor	2SD965-R	1	1	1		C
Q601	2253 0287	Transistor	2SD965-R	1	1	1		C
Resistor								
O*R600	2609 0266	Carbon film resistor	ERD-S2TJ821A	1	1	1		C
Transformer								
T600	3012 0462	Inverter	ST-029	1	1	1		C

MECHANICAL PARTS LIST

item	Code No.	Parts Name	Spec. No.	Q'ty			FOB JAPAN Unit Price	Rank
				C	N	D		
O*1	6606 5750	DP plate CA-K502	K410836-2	1	1	0		C
O*1	6605 5310	DP plate DA-K502	K410836-3	0	0	1		C
O*2	6606 4064	Upper case ass'y	K310614*1	1	1	0		X
O*2	6606 5202	Upper case ass'y	K310614*2	0	0	1		X
O*2-1	6606 4160	Adhesive tape A-K502	K410903-1	4	4	4		X
O*2-2	6606 4140	T button A-K502	K310575-1	1	1	1		X
O*2-3	6606 4150	C button A-K502	K310576-1	1	1	1		X
2-4	5860 2380	Precision (+) tap tight	PS3 1.7x3.5Bk	2	2	2		X
2-5	6604 1330	Adhesive tape A-K302	K4677-8	2	2	2		X
O*2-6	6606 4170	Adhesive tape B-K502	K410903-2	4	4	4		X
2-7	6605 8940	J cover A-K338V	K310357-1	0	1	0		X
2-8	6605 8950	Seal A-K338V	K410594-1	0	1	0		X
3	3831 0476	Speaker	2803BFA	1	1	1		C
O*4	6606 4068	Display ass'y	K110345*1	1	1	1		B
O*4-1	6606 4510	Flat cable	K410898-1	1	1	1		C
4-2	6604 8000	Insulation seal G-K52	K452-11	1	1	1		X
5	5860 0420	Precision (+) tap tight	BT3 1.7x4Ni	4	4	4		X
O*7	6606 5726	BL ass'y	K310596B*2	1	1	0		B
O*7	6606 4066	BL ass'y	K310596A*1	0	0	1		B
7-1	3632 0196	Temperature fuse	EYP-1BF102	2	2	2		B
O*7-2	3851 1085	Fluorescent lamp	8.67AC1P2-C	1	1	1		X
7-3	6604 9082	Insulation plate C-K311	K4728B-17	1	1	1		X
12	6604 1410	Felt A-K302	K4117-7	1	1	1		X
O*13	6606 4180	Reflection sheet K502	K410863-1	1	1	1		X
O*14	6606 5737	PCB-K502C-L ass'y 4	K310669*1	1	1	0		B
O*14	6606 5206	PCB-K502D-L ass'y 4	K310653*1	0	0	1		B
O*15	6606 4080	Switch knob A-K502	K310569-1	1	1	1		C
16	5860 0301	Precision (+) tap tight	BT3 1.7x3.5Ni	1	1	1		X
O*17	6606 4530	Battery spring B-K502	K410846-1	1	1	1		C
O*18	6606 4520	Battery spring A-K502	K410845-1	1	1	1		C
19	3851 1043	Rod antenna	YH790323	1	1	1		B
20	6603 8920	C knob A-K310	K3741-1	1	1	1		X
21	6606 1770	Cushion D-K331	K410731-1	1	1	1		X
O*22	6606 5724	Lower case ass'y	K310597A*3	1	1	0		C
O*22	6606 5205	Lower case ass'y	K310597*2	0	0	1		C
22-1	6020 7658	Battery spring B1 G513	P408A-1	1	1	1		C
22-2	6020 7666	Battery spring B2 G513	P409A-1	2	2	2		C
23	6605 0010	Flat screw A-K334	K410096-1	1	1	1		X
24	6604 9980	Screw A-K334	K410188-1	1	1	1		X
25	5112 0876	Tapping screw (pan)	BT3 1.7x7Bk	1	1	1		X
O*26	6606 5740	Rating plate CA-K502	K410938-1	1	0	0		X
O*26	6606 5880	Rating plate NA-K502	K410938-3	0	1	0		X
O*26	6606 5300	Rating plate DA-K502	K410938-2	0	0	1		X
27	6606 2130	Stand A-K331	K310518-1	1	1	1		C
O*28	6604 9890	Caution label B-K336	K410091-2	1	1	1		X
29	6606 4090	Battery cover A-K502	K210464-1	1	1	1		C
O*	6606 5340	Soft case A-K502	K310656-1	1	1	1		C

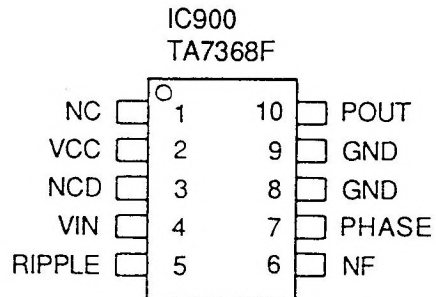
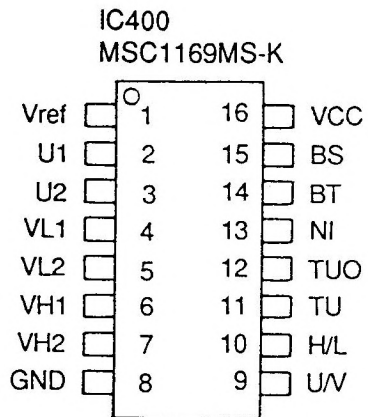
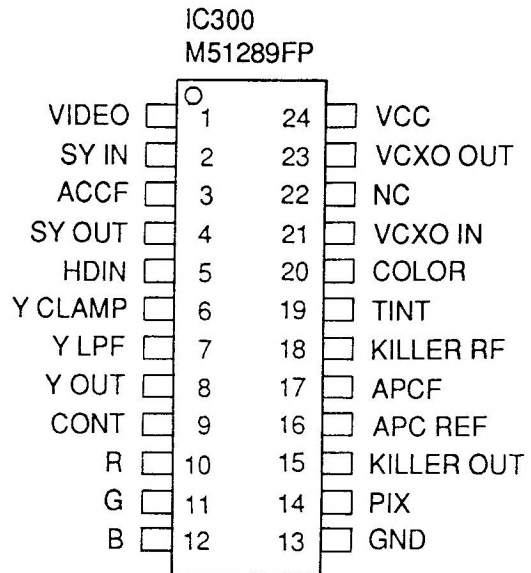
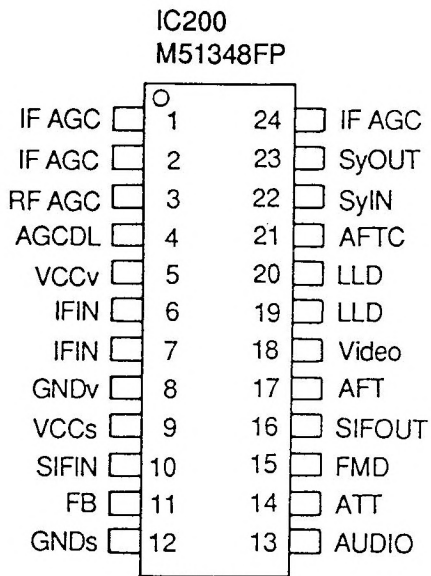
EXPLODED VIEW / DISASSEMBLY



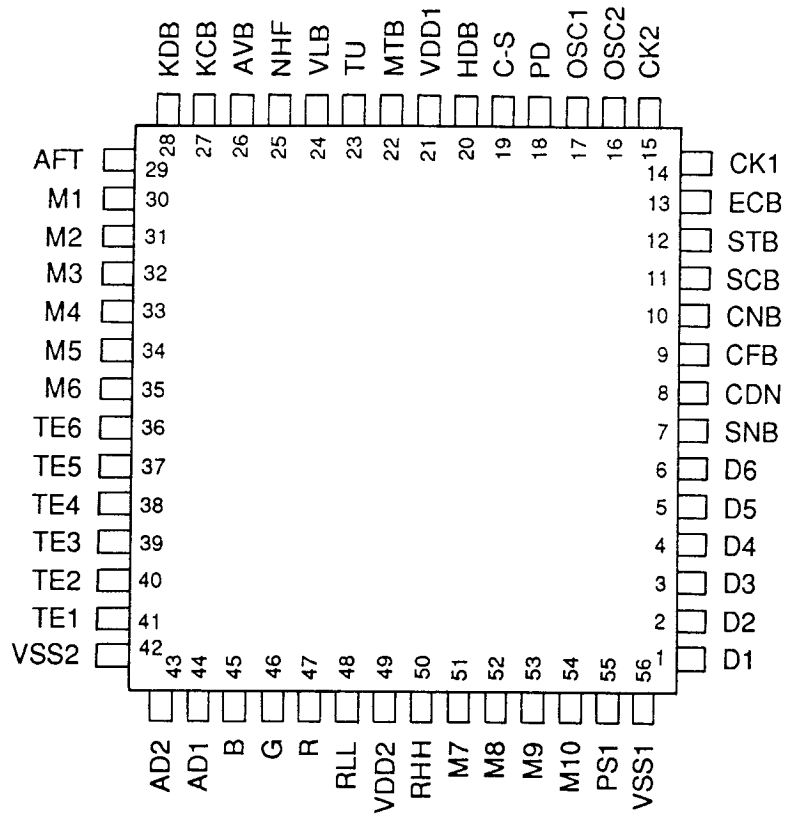


LEAD IDENTIFICATION

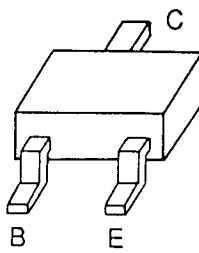
IC/LSI



IC700
MSM6525B02GSK

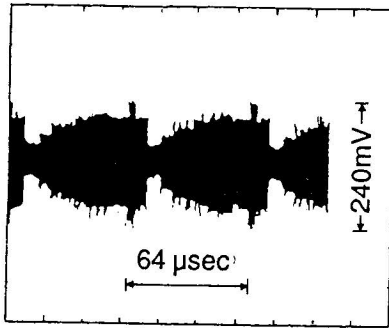


TRANSISTOR

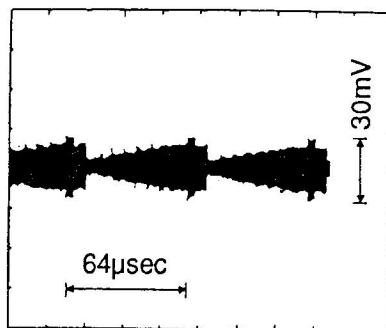


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2SC4238 2SD1119R
2SC2713

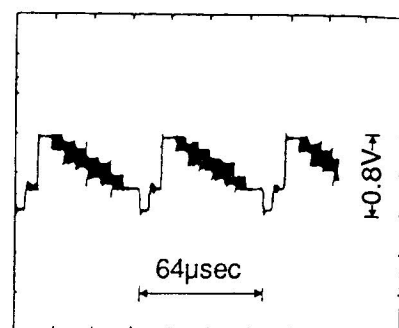
WAVEFORMS



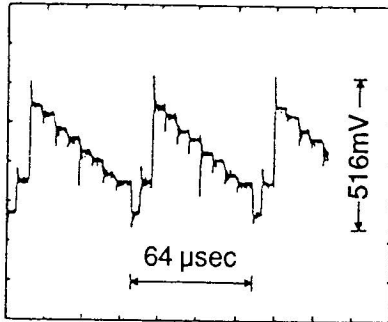
① Q200 Collector



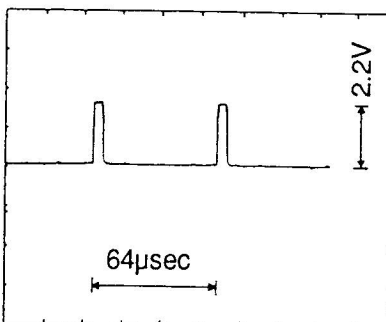
② IC200 Pins 19,20



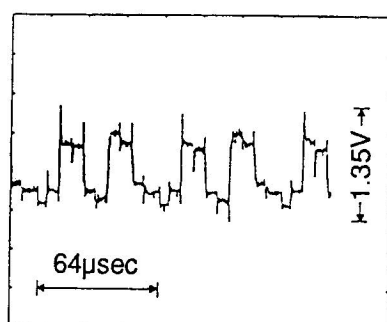
③ IC200 Pin 18



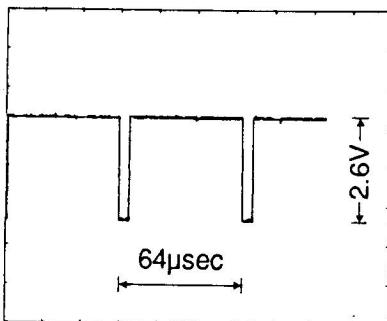
④ IC300 Pin 2



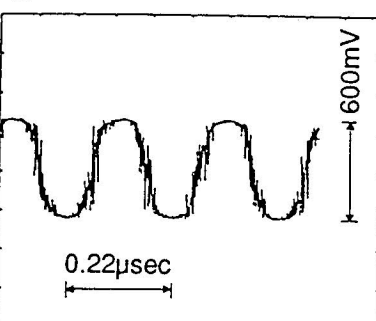
⑤ IC300 Pin 4



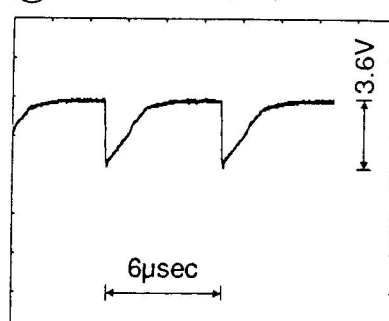
⑥ IC300 Pins 10, 11, 12



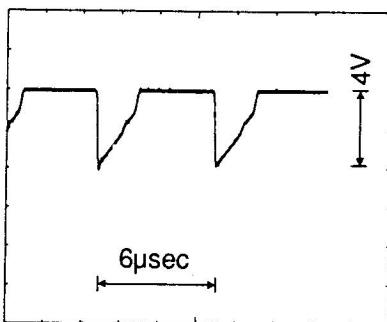
⑦ IC300 Pin 5



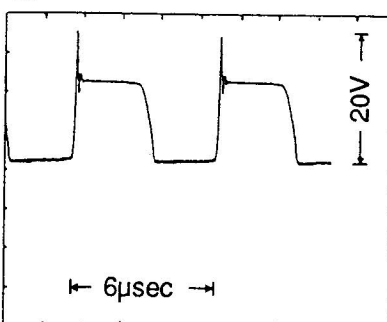
⑧ IC300 Pin 21



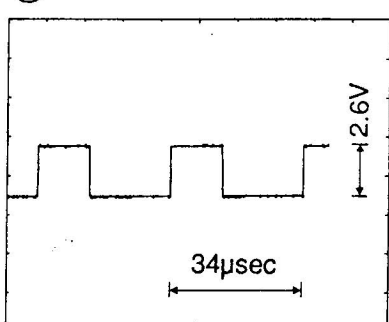
⑨ Q101 Base



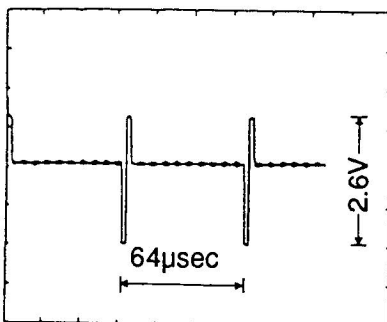
⑩ Q101 Collector



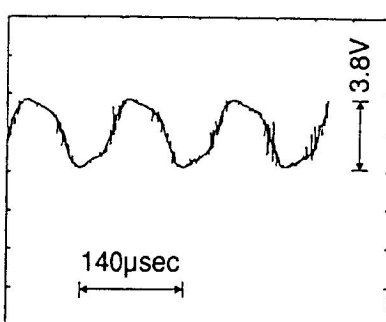
⑪ Q102 Collector



⑫ IC400 Pin11

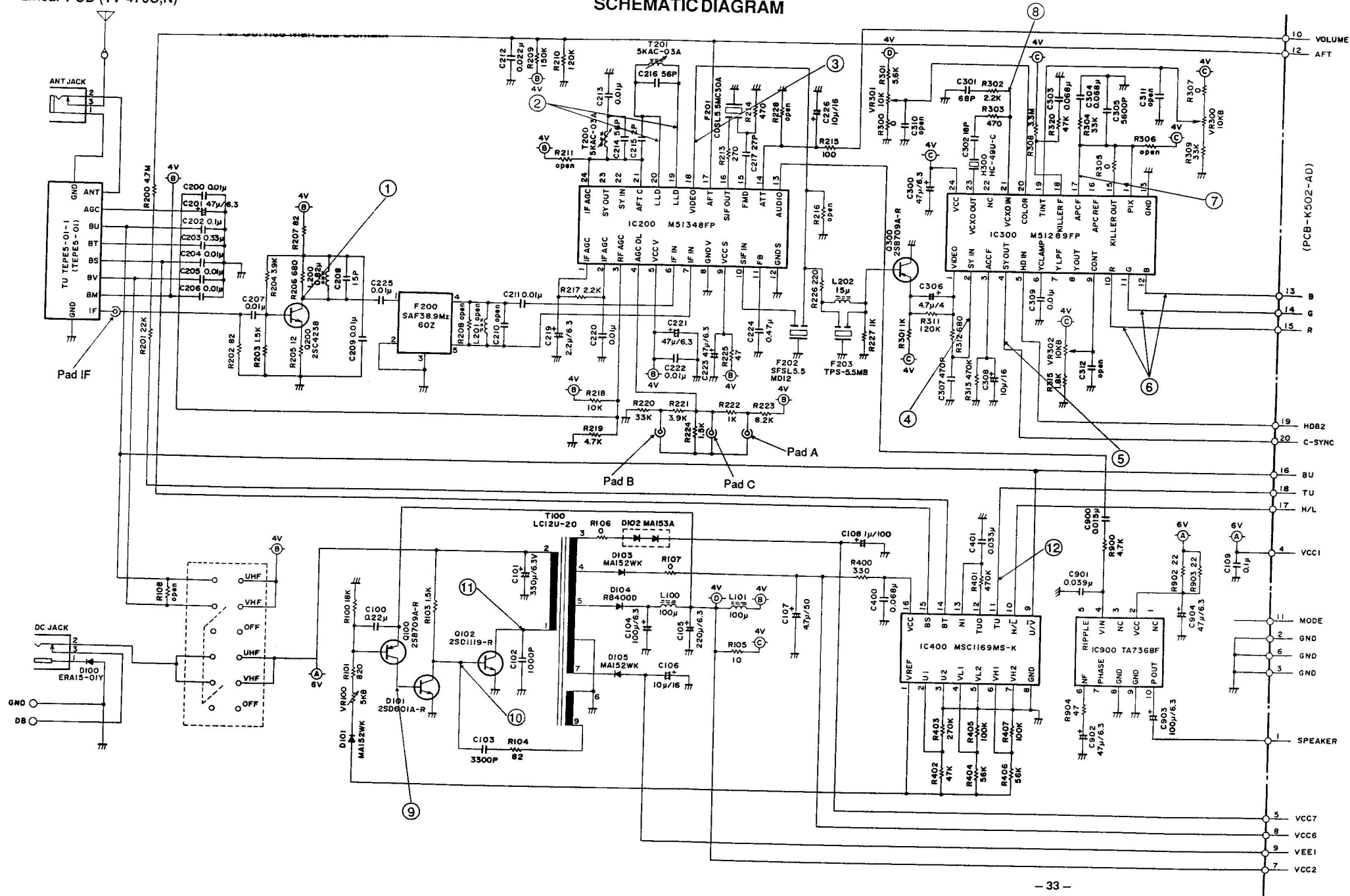


⑬ IC700 Pin 18

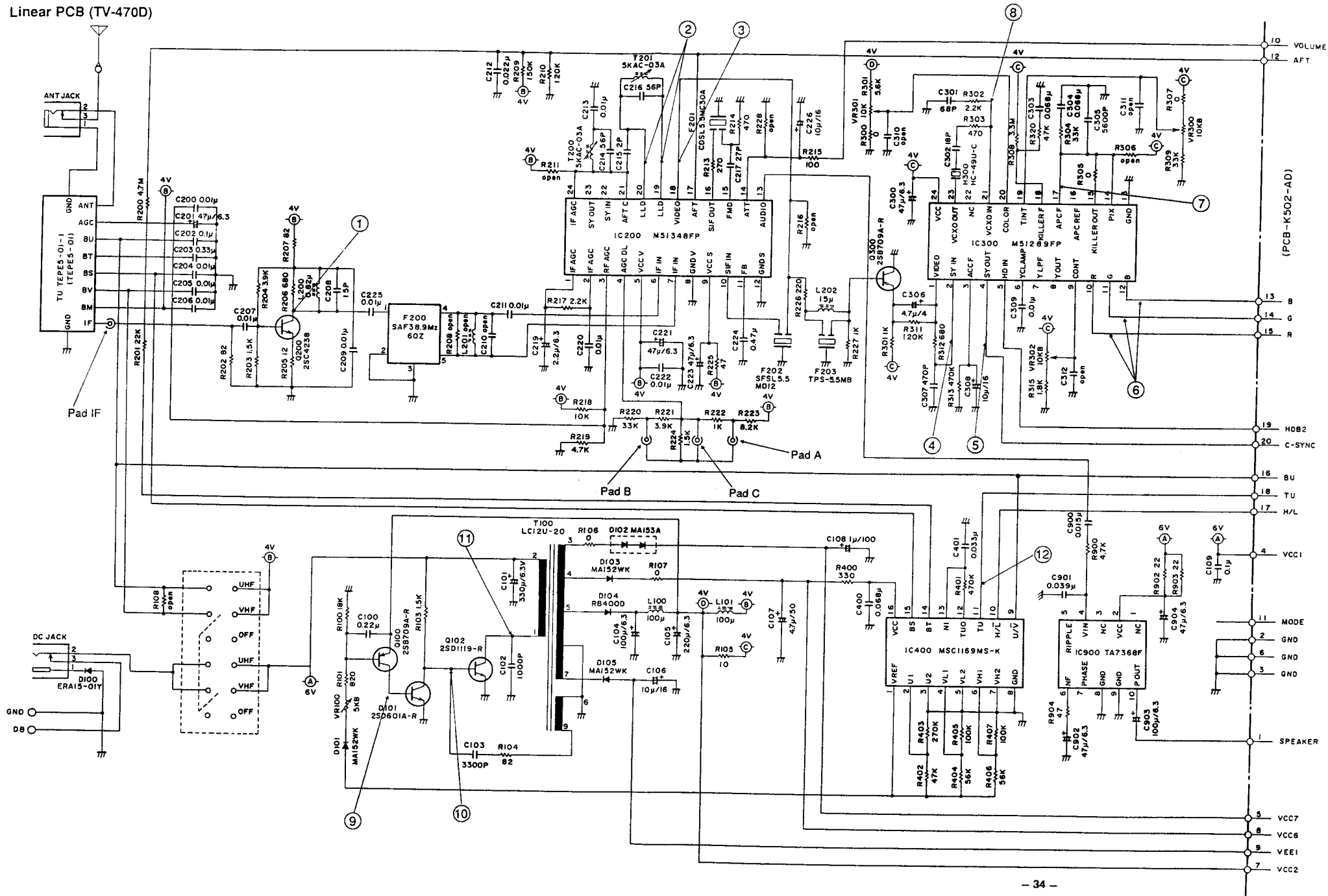


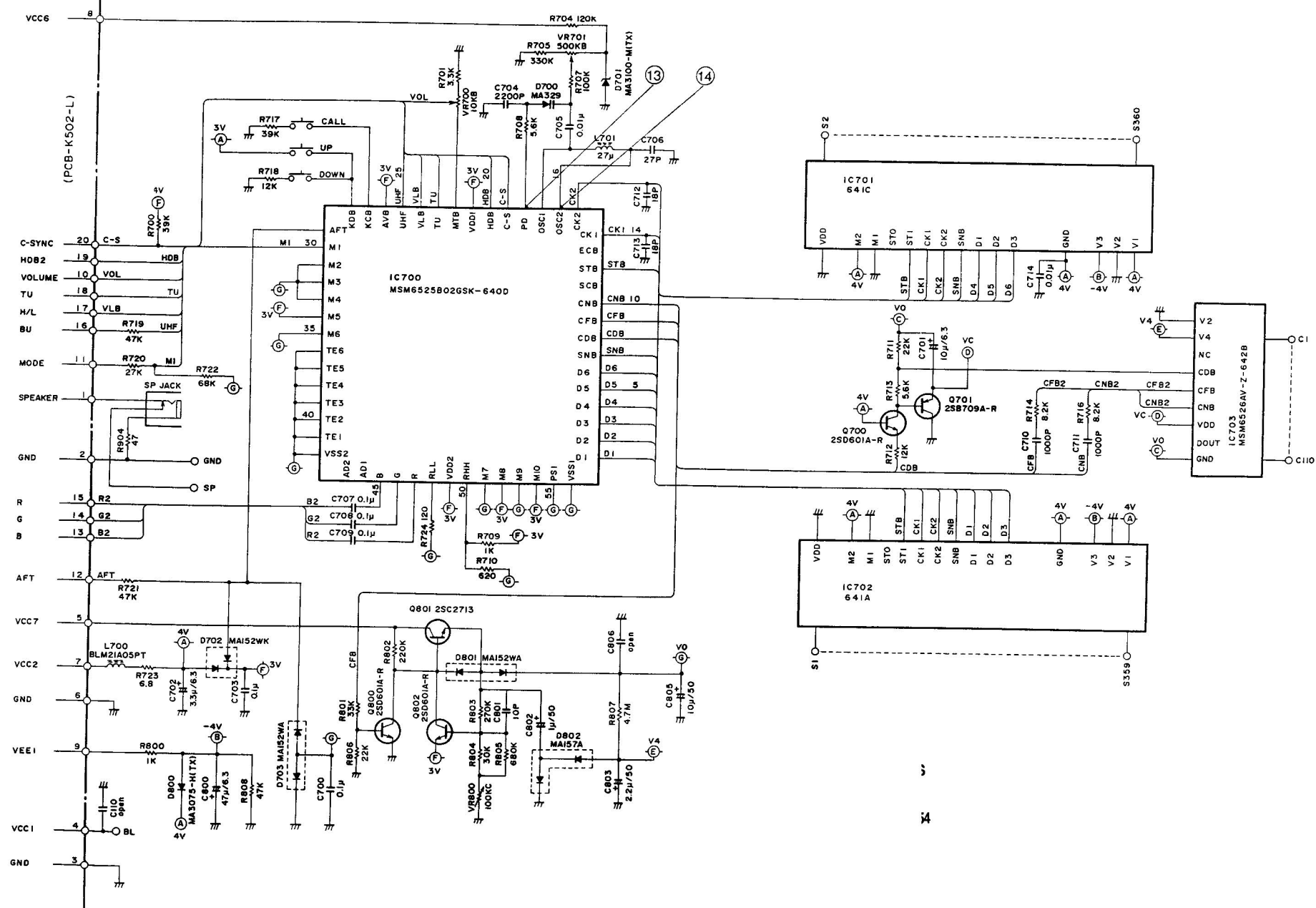
⑭ IC700 Pin 16

SCHEMATIC DIAGRAM



Linear PCB (TV-470D)





AD PCB (TV-470D)

