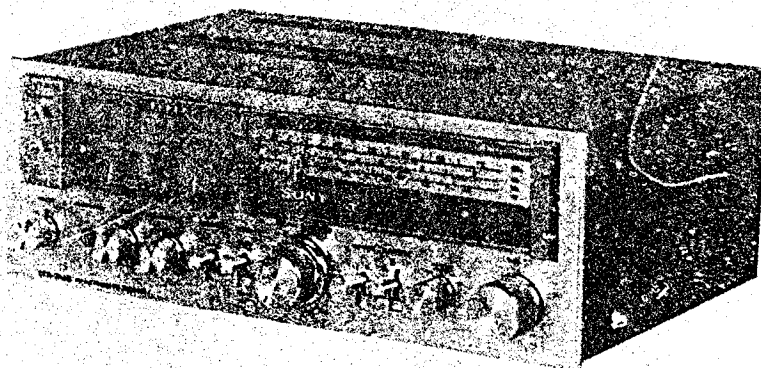


# STR-313S

P 36354

E Model



## FM-AM PROGRAM RECEIVER

### SPECIFICATIONS

#### GENERAL

**Power Requirements:** 120V, 220V or 240V ac adjustable, 50/60Hz  
**Power Consumption:** 180W  
**Dimensions:** Approx. 410(w)x145(h)x295(d)mm  
16 $\frac{1}{4}$ (w)x5 $\frac{3}{4}$ (h)x11 $\frac{1}{4}$ (d) inches  
including projecting parts and controls  
**Weight:** Approx. 7.6kg, 16 lb 13 oz (net)  
Approx. 8.8kg, 19 lb 7 oz (in shipping carton)

**S/N Ratio:** 75dB (MONO)  
70dB (STEREO)  
**Harmonic Distortion:** At 100Hz  
0.2% (MONO)  
0.3% (STEREO)  
At 1 kHz  
0.2% (MONO)  
0.3% (STEREO)  
At 10kHz  
0.3% (MONO)  
0.5% (STEREO)

#### FM SECTION

**Frequency Range:** 87.5–108MHz  
**Antenna:** 300  $\Omega$  balanced  
75  $\Omega$  unbalanced  
**Intermediate Frequency:** 10.7MHz  
**Sensitivity**  
**at 50dB Quieting:** 3.5 $\mu$ V (10.7dB) (MONO)  
45 $\mu$ V (33dB) (STEREO)  
**Usable Sensitivity:** 1.8 $\mu$ V (5dB), IHF

**IM Distortion:** 0.2% (MONO)  
0.3% (STEREO)  
**Separation:** 30dB at 100Hz  
45dB at 1 kHz  
35dB at 10 kHz

**Frequency Response:** 30–15,000Hz  $^{+0.5}$  $_{-2.0}$  dB  
**Selectivity:** 60dB (400kHz)  
**Capture Ratio:** 1.0dB

— Continued on page 2 —

"SAFETY RELATED COMPONENT WARNING"  
COMPONENTS IDENTIFIED BY SHADING AND MARK  
ON THE SCHEMATIC DIAGRAMS EXPLODED  
VIEWS AND IN THE PARTS LIST ARE CRITICAL TO  
SAFE OPERATION. REPLACE THESE COMPONENTS  
WITH SONY PARTS WHOSE PART NUMBERS APPEAR  
AS SHOWN IN THIS MANUAL OR IN SUPPLEMENT.

# SONY

## SERVICE MANUAL

**AM Suppression Ratio:** 54dB  
**Image Response Ratio:** 45dB  
**IF Response Ratio:** 90dB  
**Spurious Response Ratio:** 75dB  
**RF Intermodulation:** 60dB  
**Muting Threshold:** Approx. 5 $\mu$ V

## SW/MW SECTION

**Frequency Range:** SW 1: 2.3–6.2MHz  
 SW 2: 7–17.9MHz  
 MW: 530–1,605kHz  
**Antenna:** External antenna terminal  
 Attached antenna wire  
**Intermediate Frequency:** 455kHz  
**Usable Sensitivity:** SW 1: 30  $\mu$ V (29.5dB), external antenna (4MHz)  
 SW 2: 30  $\mu$ V (29.5dB), external antenna (12MHz)  
 MW: 100  $\mu$ V (40dB), external antenna (1,000kHz)  
**S/N Ratio:** 52dB (5mV)  
**Harmonic Distortion:** 0.3% (5mV, 400Hz)  
**Selectivity:** 28dB (9kHz)  
 30dB (10kHz)

## AUDIO AMPLIFIER SECTION

### Continuous RMS

**Power Output:** Less than 0.5% THD, both channels driven simultaneously  
 At 20–20,000Hz  
 25W+25W (8  $\Omega$ )  
 At 1kHz  
 27W+27W (8  $\Omega$ )  
 According to DIN 45500  
 25W+25W (8  $\Omega$ )  
 25W+25W (4  $\Omega$ , less than 0.7% THD)  
**Dynamic Power Output:** IHF constant power supply method  
 90W (8  $\Omega$ )  
**Power Bandwidth:** 10–40,000Hz, IHF  
**Damping Factor:** 20 at 1kHz (8  $\Omega$ )

**Harmonic Distortion:** Less than 0.5% at rated output (8  $\Omega$ )  
 Less than 0.7% at rated output (4  $\Omega$ )  
 Less than 0.2% at 1W output (8  $\Omega$ )  
 Less than 0.3% at 1W output (4  $\Omega$ )  
**IM Distortion:** Less than 0.5% at rated output  
 (60Hz: 7kHz=4:1) Less than 0.2% at 1W output  
**Residual Noise:** Less than 0.08 $\mu$ W (8  $\Omega$ )  
**Frequency Response:** PHONO:  
 RIAA equalization curve  $\pm$  1dB  
 TAPE:  
 10–50,000Hz +1dB  
 -3dB

### Inputs:

	Sensitivity	Impedance	S/N	Weighting network
PHONO	2.5mV (-50dB)	50k $\Omega$	70 dB	A
TAPE	150mV (-14.5dB)	100k $\Omega$	90 dB	A

Measured with rated output power into 8  $\Omega$  loads (both channels driven simultaneously) at 1kHz.

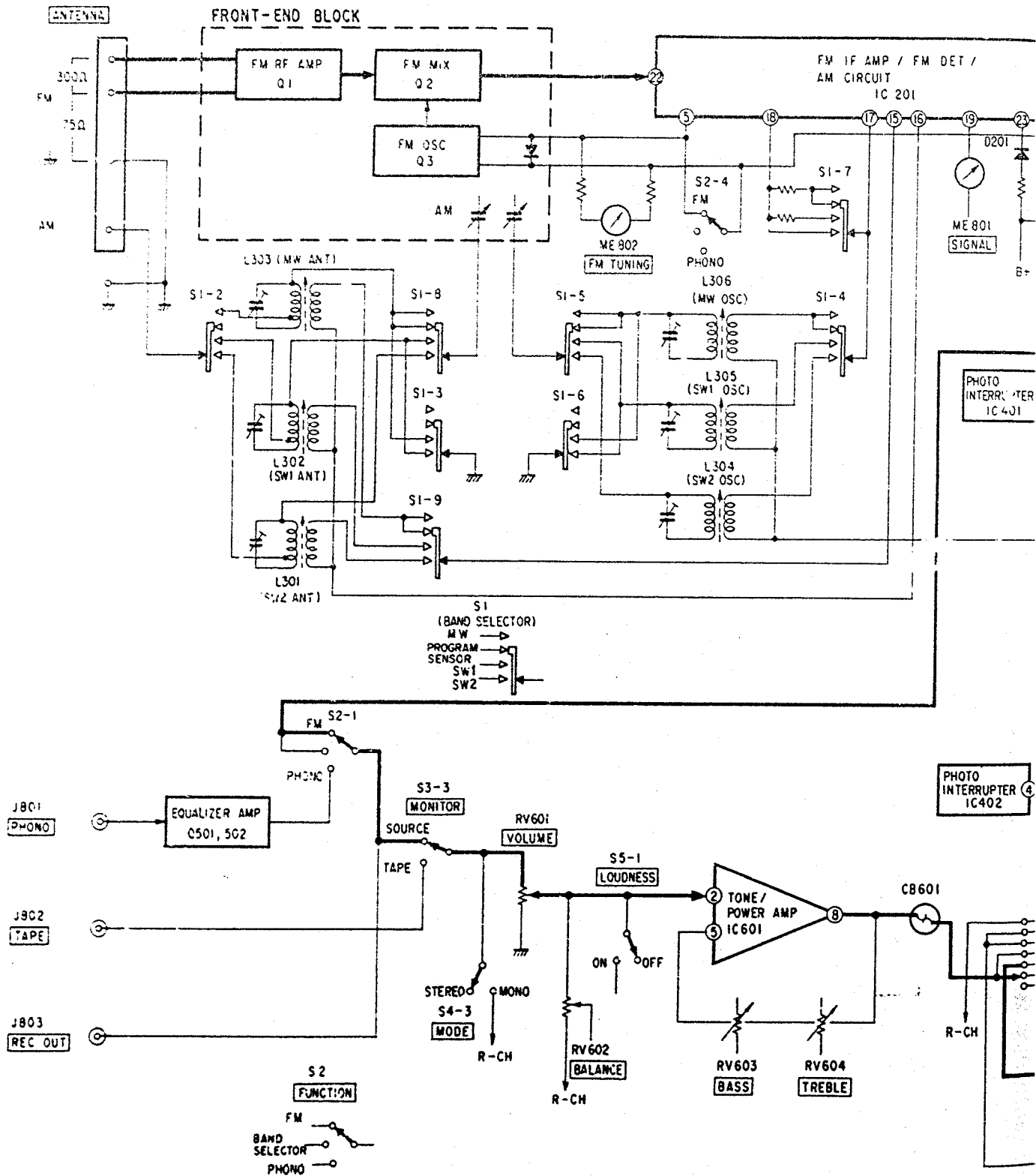
### Outputs: (with rated input)

	Voltage	Impedance
REC OUT	150mV (14.5dB)	10k $\Omega$

**Headphones:** Accepts all low or high impedance headphones  
**Speaker:** 4–16  $\Omega$  speakers are suitable.  
**Tone Controls:** BASS +8dB at 100Hz  
 TREBLE +8dB at 10kHz  
**Loudness Control:** +8dB at 100Hz  
 (att. 30dB) +3dB at 10kHz

SECTION 1  
OUTLINE

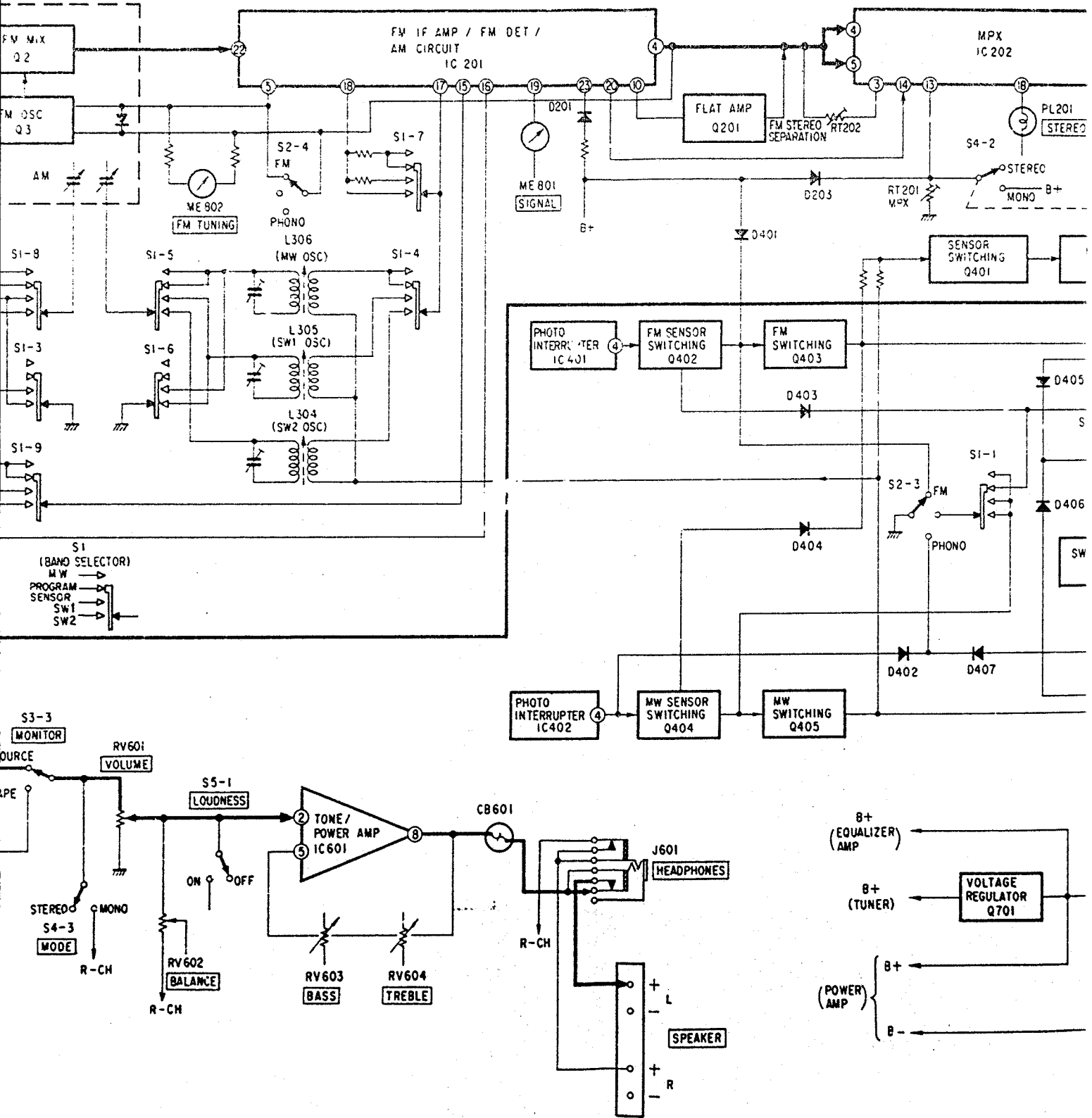
1-1. BLOCK DIAGRAM

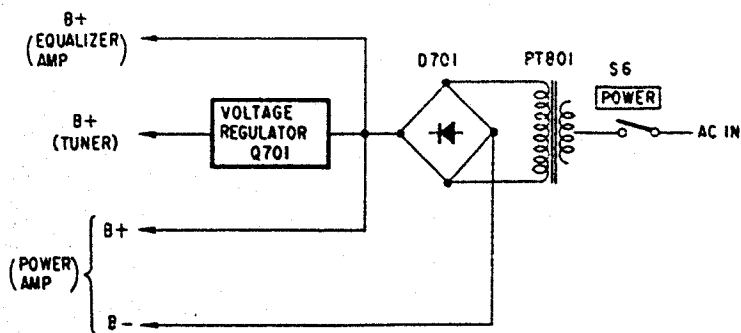
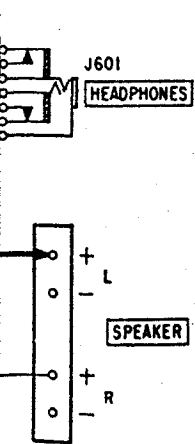
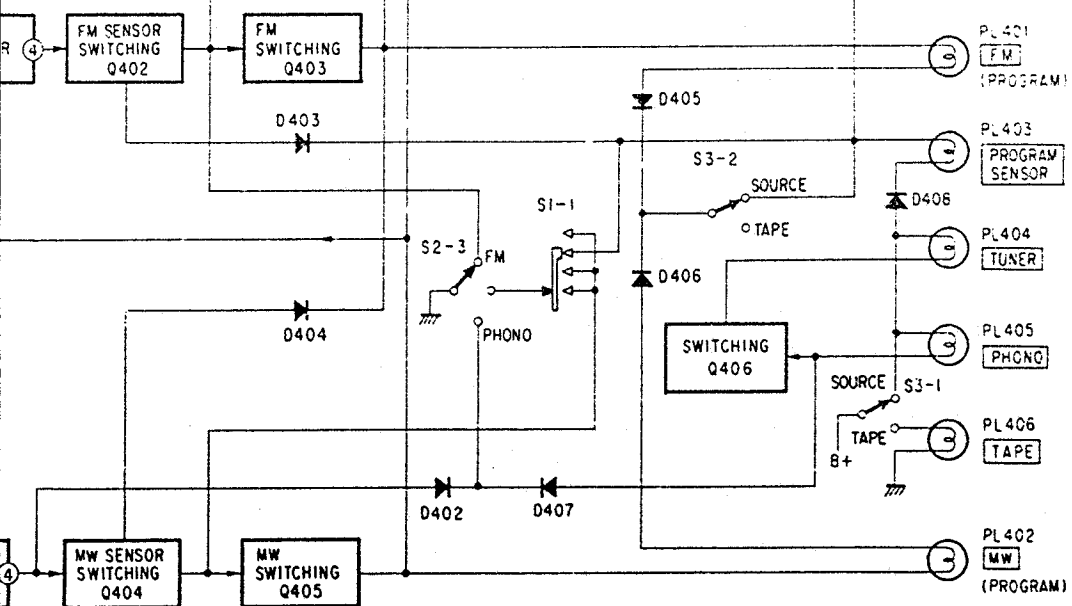
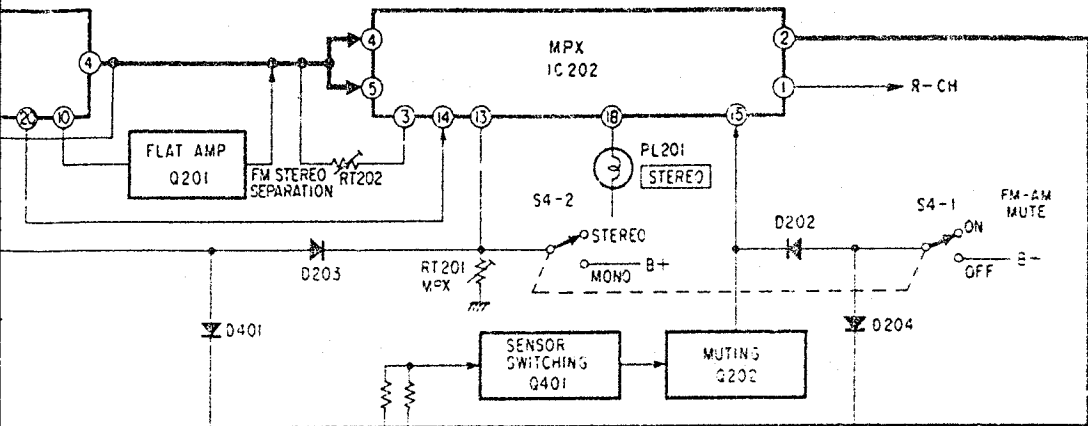


STR-313S

STR-313S

ION 1  
LINE





1-2. CIRCUIT DESCRIPTION (See Fig. 1)

Program Sensor

When the band selector switch (S1) and FUNCTION switch (S2) are set to PROGRAM SENSOR position and band selector position respectively and the pointer matches with a station marker, FM or MW station is automatically selected through optical detection. (Fig. 2)

1) When the pointer matches only with the FM station marker:

- a) The light of IC401 (Photo Interrupter) is intercepted by the marker, the bias voltage is applied to the base of Q402 through R405, and Q402 is turned on.
- b) The collector voltage of Q402 reduces and D401 is turned on.
- c) The terminal (23) of IC201 is grounded through D201, R204, D401, Q402 and D403.
- d) FM circuit operates (The terminal (23) of IC201 serves as a switch).

Note: When B + voltage is applied to the terminal (23) of IC201 through R401, R204 and D201, the receiver is in AM mode.

e) At the same time, as Q403 is on, PL401 (FM indicator lamp) lights.

2) When the pointer matches only with the MW station marker:

- a) As the light of IC401 is not intercepted, Q402 and D401 are turned off. As a result, B + voltage is applied to the terminal (23) of IC201 through R401, R204 and D201. On the other hand, the light of IC402 is intercepted by the MW station marker.
- b) Q404 and Q405 are turned on.
- c) B + voltage is applied to L306 (MW oscillator coil).
- d) MW circuit operates. When Q405 is on, PL402 (MW indicator lamp) simultaneously lights.

3) When the pointer matches simultaneously with both the FM and MW station markers:

- a) Q402 and Q403 are turned on by intercepting the light of IC401. On the other hand, the light of IC402 is also intercepted and the bias voltage is applied to the base of Q404, but because the collector voltage of Q403 is high, D404 is turned off. The emitter voltage of Q404 rises and B + voltage is not applied to L306 (MW oscillator coil) and PL402. Consequently, only the FM station signal is received.

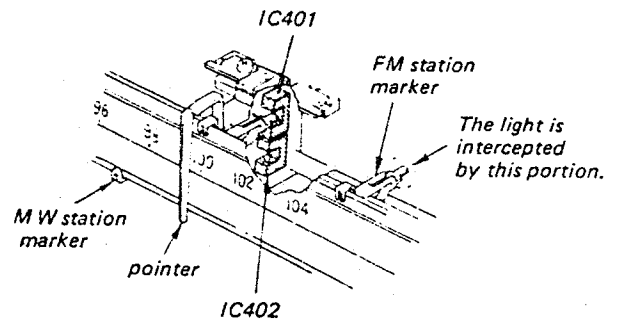


Fig. 2

Q202 and 401

Q401 operates to improve the rise time of PL401 (FM indicator lamp) or PL402 (MW indicator lamp) when tuning the receiver, and at the same time Q401 switches Q202. Q202 serves as a high-speed-muting switch which is turned on or off as soon as the station signal is tuned or detuned.

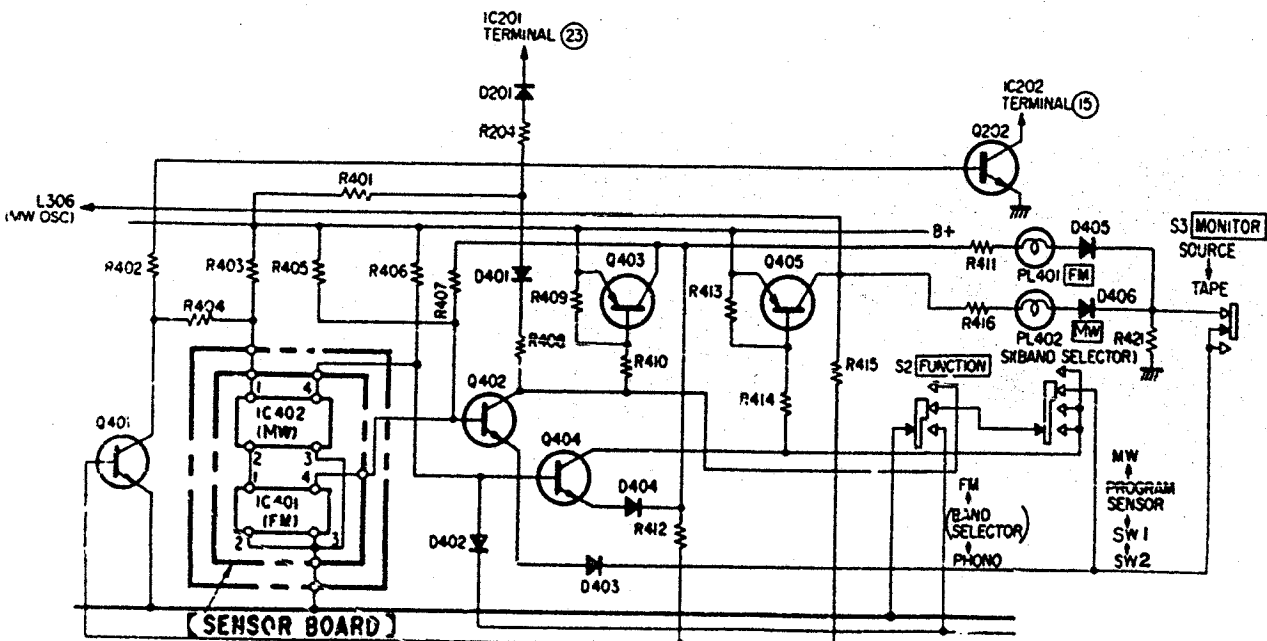


Fig. 1

**IC201 (CX168), IC202 (CX178)**

These two ICs form a system. Both of them are bipolar-linear-ICs. CX168 integrates 343 elements and CX178 integrates 260 elements. They include many functions and are improved upon the degree of integration now available as a linear-ICs for tuner use. They have high performance in FM reception and form a muting system having an FM muting attenuation of 90dB. In addition, because a muting circuit is newly employed in the AM circuit not only is there high performance in FM reception but AM station signal can be received with fine tone quality and sensitivity as with FM broadcasting station. As an additional function, they operate for FM/AM continuous station selection, FM/AM signal-strength meter output, FM/AM muting output switching and enforced AGC at FM reception.

**CX168 Main Function**

**<FM>**

- IF Amplifier
- Quadrature detector
- Signal-strength Meter Output
- Muting Signal Output
- AFC Output for Converter
- Multipath Signal Output
- Bandpass Control Circuit

**<AM>**

- RF Attenuator
- Mixer
- Oscillator
- IF Amplifier and AGC
- AM Detector
- Signal-Strength Meter Output
- Signal Generator for AM Muting

**<General>**

- Regulator
- FM/AM Switching
- Regulator Output

**CX178 Main Function**

**<FM Stereo Demodulator>**

- FM Stereo Demodulator
- Phase Detector
- Stereo Indicating Circuit
- VCO
- VCO ON/OFF Circuit

**<General>**

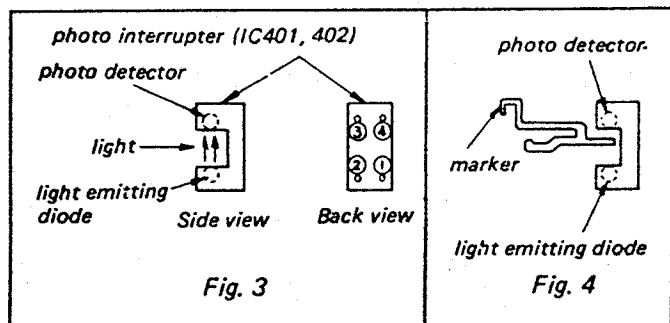
- Muting Gate
- Regulator
- Muting Canceler Circuit
- Pop-noise Canceler
- Hysteresis Circuit

**Photo Interrupter (IC401, 402)**

The terminals (1) and (2) of the photo interrupter operates as the light emitting diode. On the other hand, the terminals (3) and (4) operates as the photo detector. When the photo detector receives the light as shown in Fig. 3, the terminal between terminals (3) and (4) is a low-impedance. When light is intercepted by the marker, as shown in Fig. 4, it becomes high-impedance.

When the photo detector receives the light

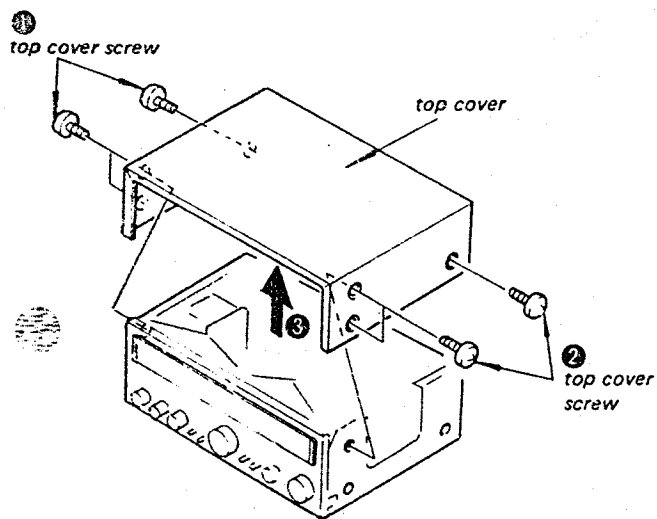
When light is intercepted



## SECTION 2 DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

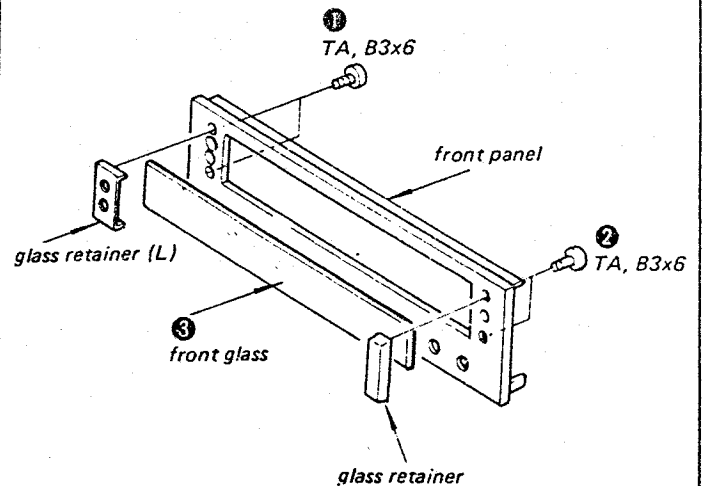
### TOP COVER REMOVAL



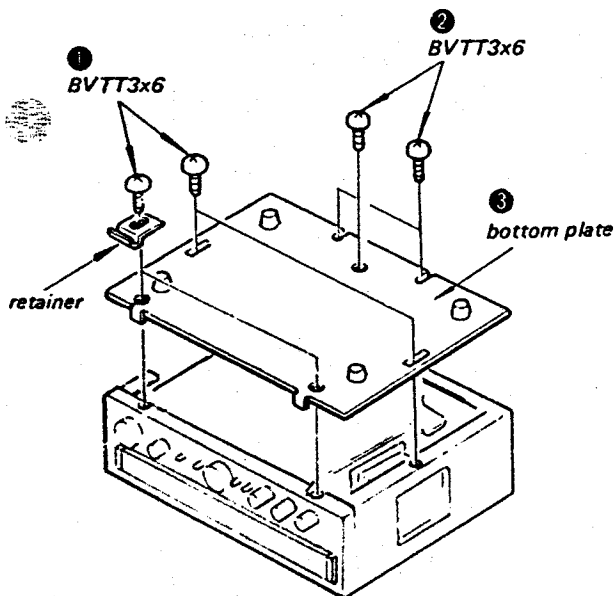
### DIAL CORD STRINGING

- See page 9.

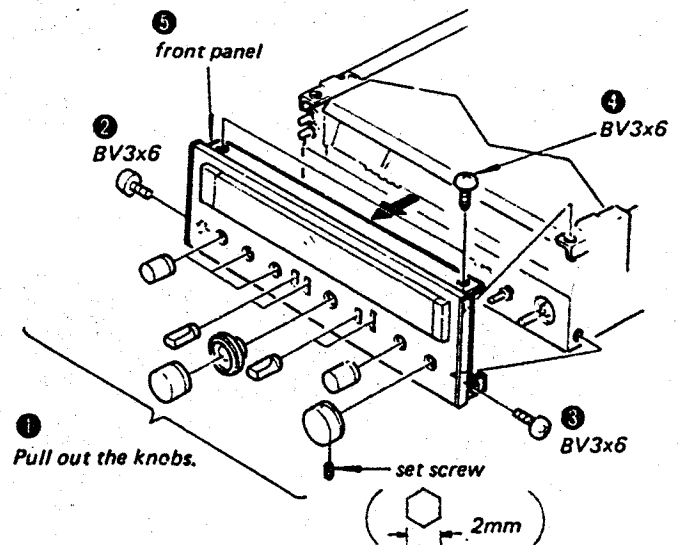
### FRONT GLASS REMOVAL



### BOTTOM PLATE REMOVAL

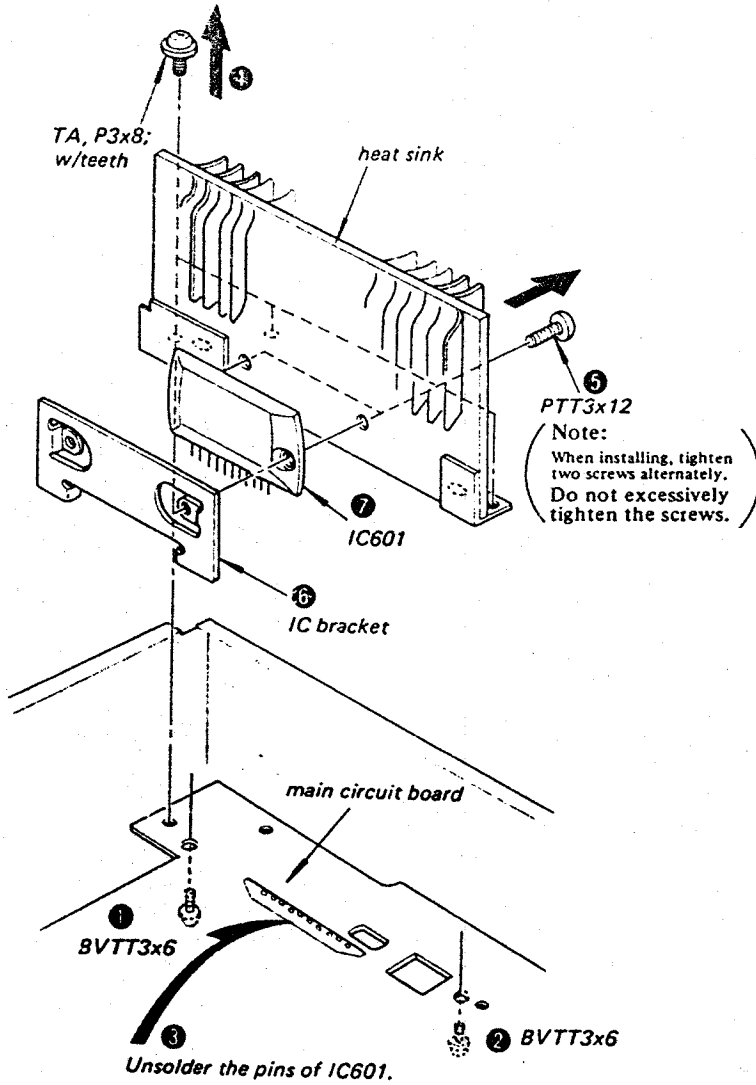


### FRONT PANEL REMOVAL





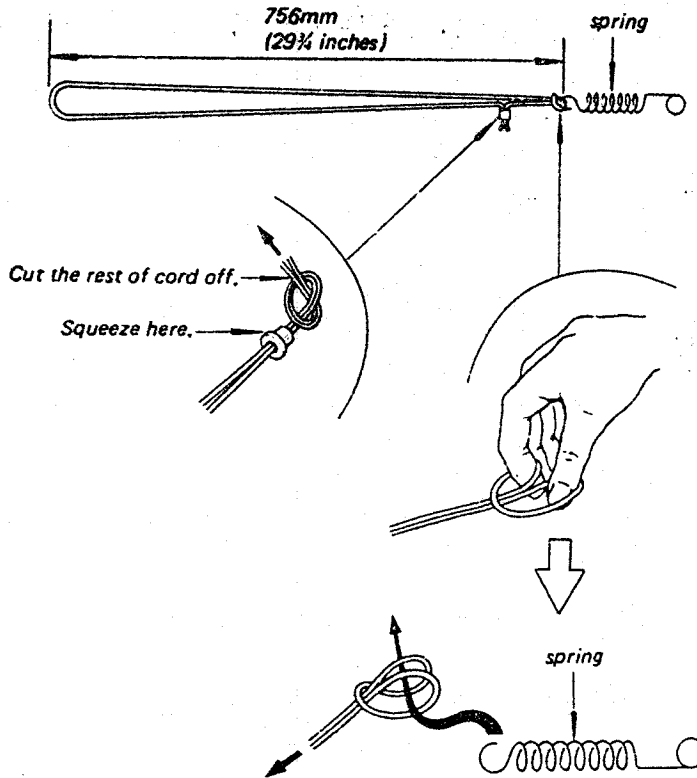
IC REPLACEMENT



For Service Manuals  
**MAURITRON SERVICES**  
8 Cherry Tree Road, Chinnor  
Oxfordshire, OX9 4QY.  
Tel (01844) 351694  
Fax (01844) 352554  
email: mauritron@dial.pipex.com

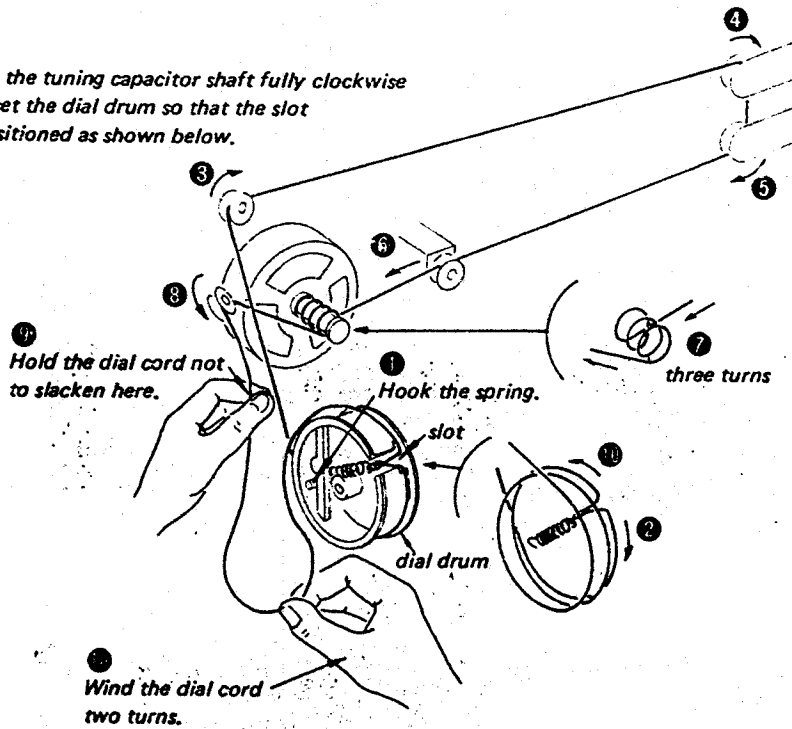
**DIAL CORD STRINGING**

**1) Preparation**



**2) Stringing**

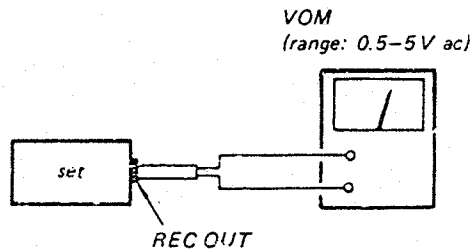
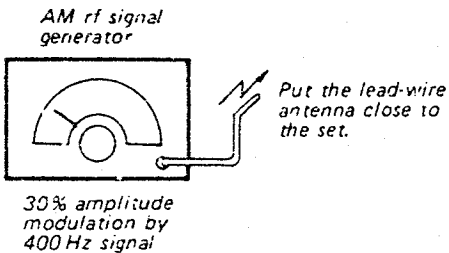
Turn the tuning capacitor shaft fully clockwise and set the dial drum so that the slot is positioned as shown below.



**SECTION 3  
ADJUSTMENTS**

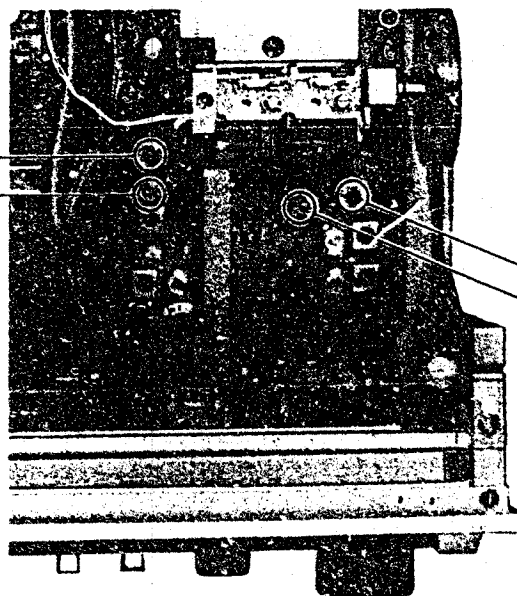
**3-1. MW SECTION**

Setting: FUNCTION switch: (Band Selector)  
(Band Selector): MW



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

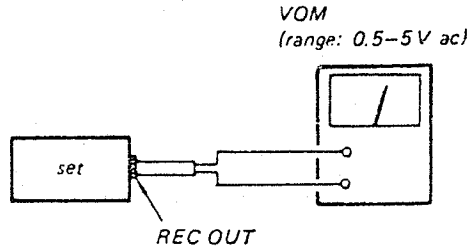
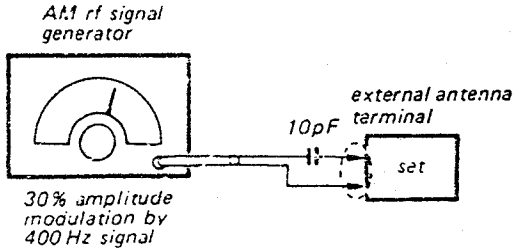
MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
520kHz	L306
1680kHz	CT306



MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L303	600kHz
CT303	1,400kHz

3-2. SW SECTION

Setting: FUNCTION switch: (Band Selector)  
 (Band Selector): SW1, SW2



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

<b>SW1 TRACKING ADJUSTMENT</b>	
Adjust for a maximum reading on VOM.	
6MHz	3MHz
CT302	L302

<b>SW1 FREQUENCY COVERAGE ADJUSTMENT</b>	
Adjust for a maximum reading on VOM.	
2.1MHz	L305
6.5MHz	CT305

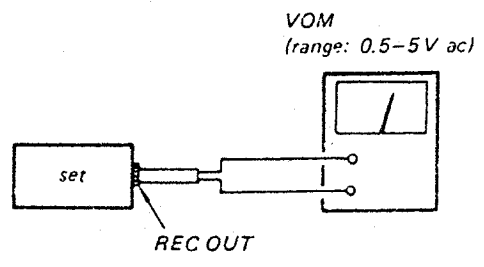
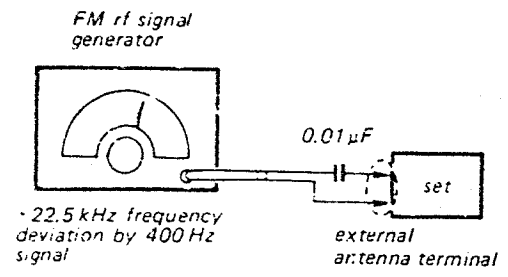
L304	CT304
6.8MHz	18.4MHz
Adjust for a maximum reading on VOM.	
<b>SW2 FREQUENCY COVERAGE ADJUSTMENT</b>	

CT301	L301
15MHz	8MHz
Adjust for a maximum reading on VOM.	
<b>SW2 TRACKING ADJUSTMENT</b>	

**3-3. FM SECTION**

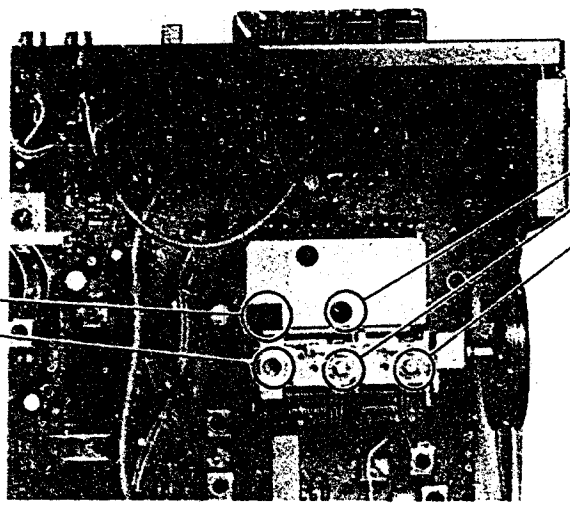
Setting: FUNCTION switch: FM



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



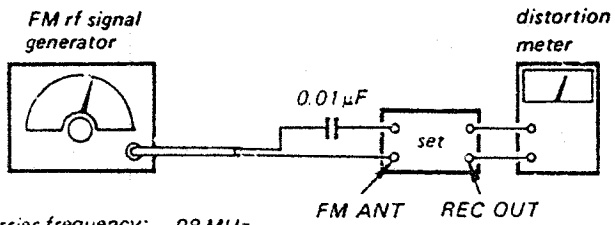
FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
87.1MHz	L3
108.5MHz	TC3



FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L2	87.1MHz
TC2	108.5MHz
TC1	

**FM DISCRIMINATOR ALIGNMENT 2**

**Procedure:**



Carrier frequency: 98 MHz  
 Output level: 1mV (60 dB)  
 Modulation: 400 Hz, 75 kHz deviation (100%)

1. Set MODE switch to MONO.
2. Turn the core (secondary side) of IFT201 for a minimum distortion reading on the distortion meter.

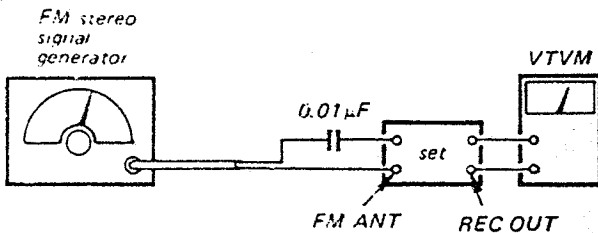
**FM DISCRI**

**Procedure:**

1. Detune t
2. Turn the point rea

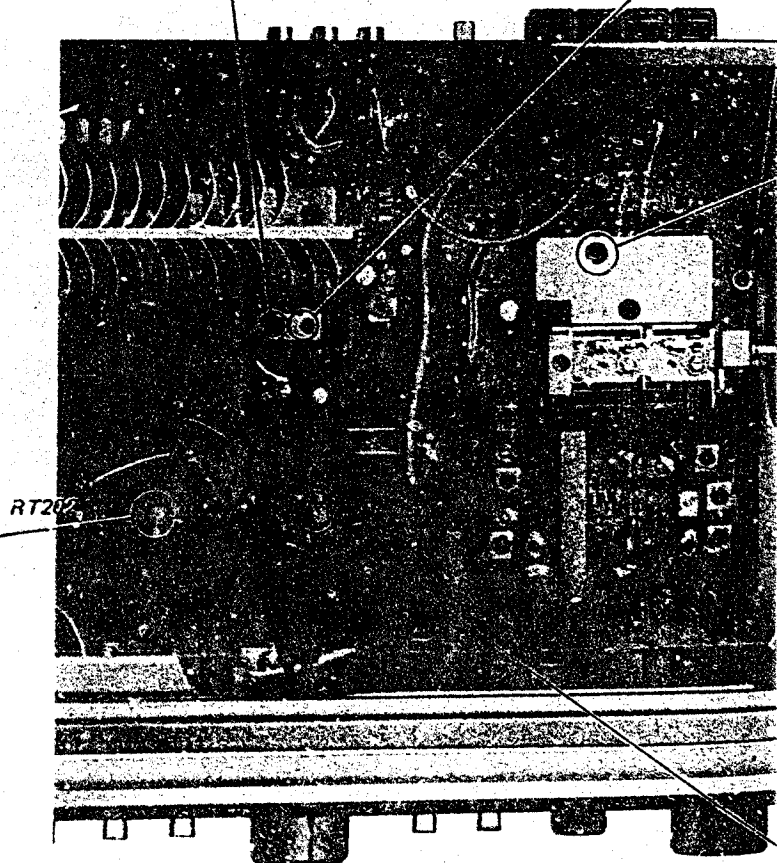
**FM STEREO SEPARATION ADJUSTMENT**

**Procedure:**



Carrier frequency: 98 MHz  
 Output level: 1 mV (60 dB)  
 Mod: Stereo  
 Modulation:  
 Audio (400 Hz): 67.5 kHz deviation (90%)  
 Pilot (19 kHz): 7.5 kHz deviation (10%)  
 MODE switch: STEREO

IFT201 (secondary side: black)



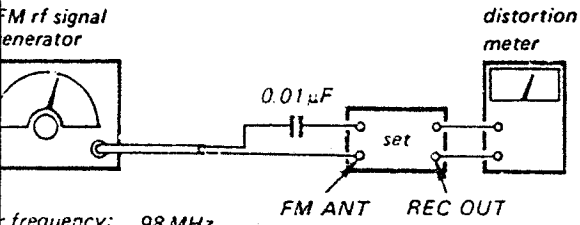
FM stereo signal generator output channel	VTVM connection	VTVM reading
L-CH	L-CH	A
R-CH	L-CH	B
R-CH	R-CH	C
L-CH	R-CH	D

Stereo separation A B  
 C D

The difference between separations A - B and C - D are to be equal.

**DISCRIMINATOR ALIGNMENT 2**

**Procedure:**



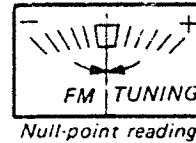
Carrier frequency: 98 MHz  
 Output level: 1mV (60 dB)  
 Modulation: 400 Hz, 75 kHz deviation (100%)  
 Set MODE switch to MONO.

Turn the core (secondary side) of IFT201 for a minimum distortion reading on the distortion meter.

**FM DISCRIMINATOR ALIGNMENT 1**

**Procedure:**

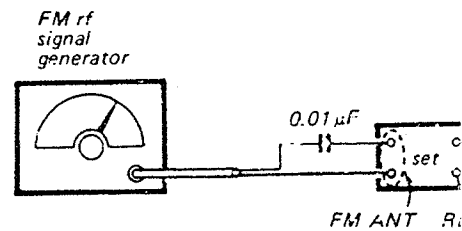
1. Detune the set.
2. Turn the core (primary side) of IFT201 for null-point reading on the FM TUNING meter.



IFT201 (primary side: blue)

IFT201 (secondary side: black)

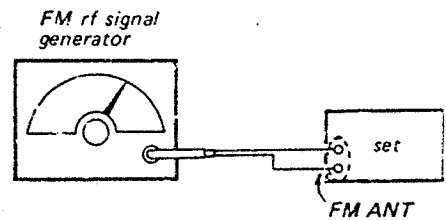
**FM IF ALIGNMENT**



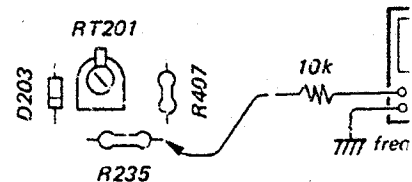
**MPX ADJUSTMENT**

**A) Regular Method**

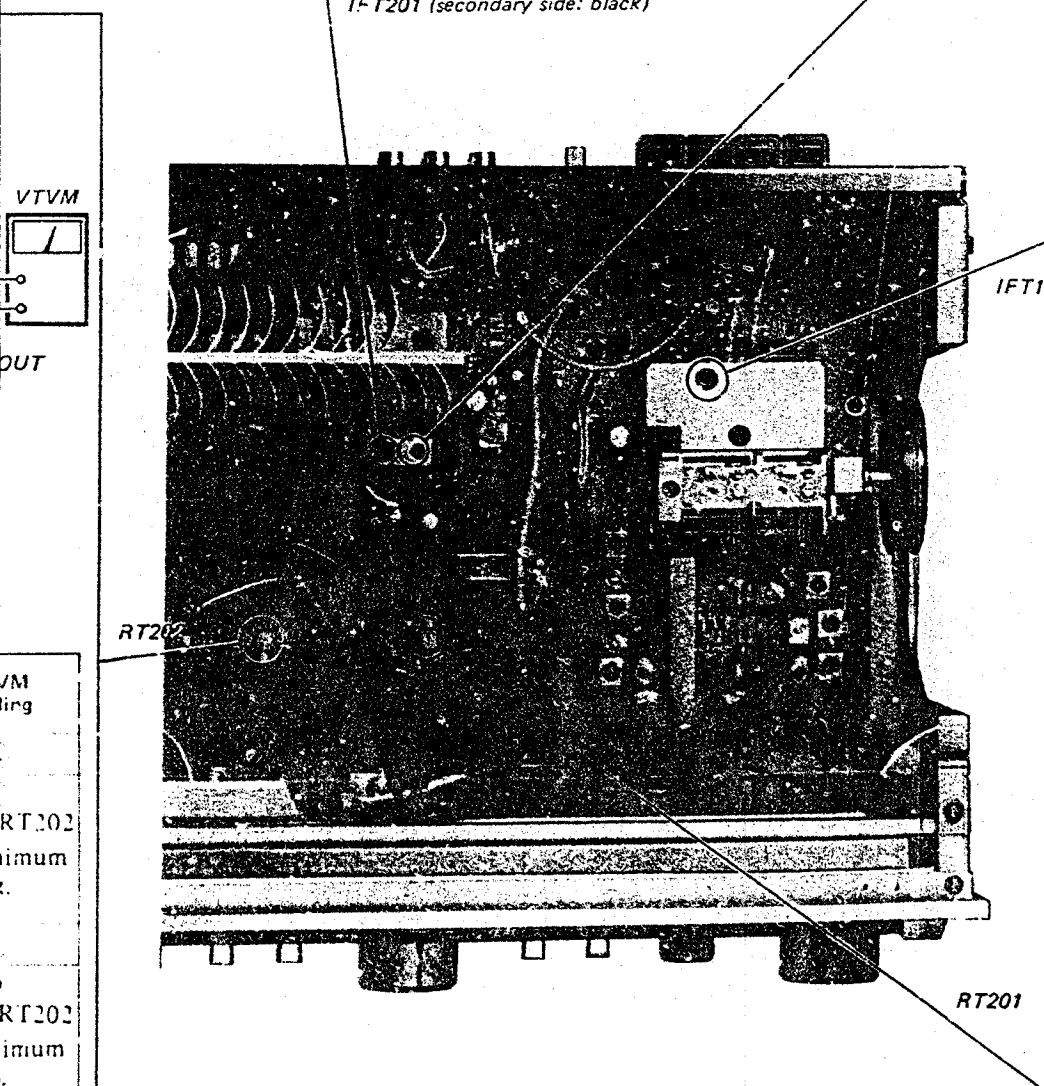
**Procedure:**



Carrier frequency: 98 MHz  
 Modulation: no modulation  
 Output level: 1 mV (60 dB)



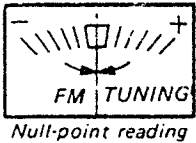
1. Tune the set to 98 MHz.
2. Adjust RT201 for 76 kHz ±100Hz on the FM TUNING meter.



For Service Manuals  
**MAURITRON SERVICES**  
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 email: mauritron@diel.pipax.com

## MINATOR ALIGNMENT 1

the set.  
 core (primary side) of IFT201 for nulling on the FM TUNING meter.



IFT201 (primary side: blue)

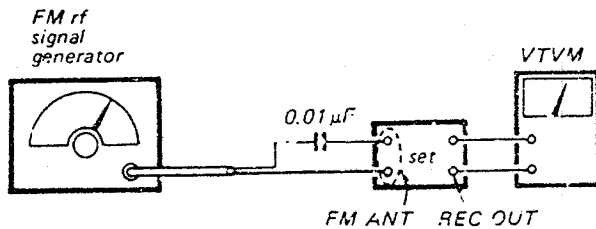
## FM IF ALIGNMENT

### FM Signal Generator Setting:

Carrier frequency: 98 MHz  
 Modulation: 400 Hz, 75 kHz deviation (100%)  
 Output level: 12  $\mu$ V (21.5 dB)

### Procedure:

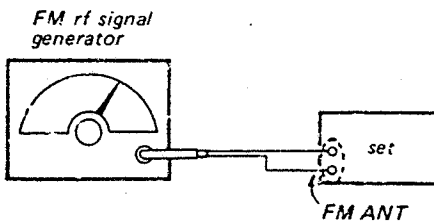
Tune the set to 98 MHz and adjust IFT1 for a maximum reading on the VTVM.



## MPX ADJUSTMENT

### A) Regular Method

#### Procedure:

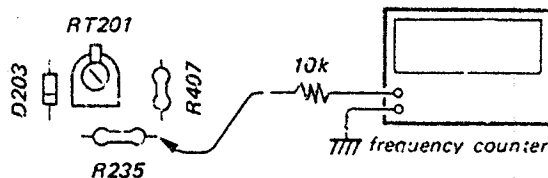
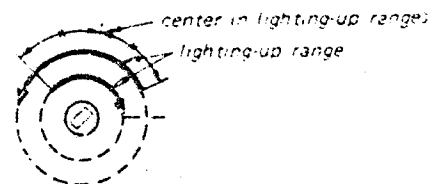


Carrier frequency: 98 MHz  
 Modulation: no modulation  
 Output level: 1 mV (60 dB)

### B) Simple Method

#### Procedure:

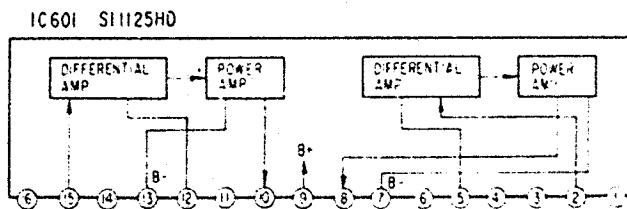
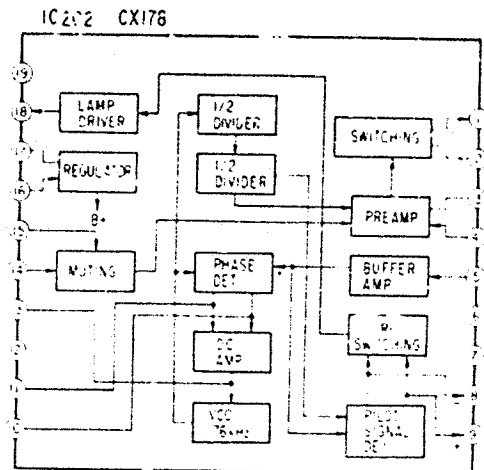
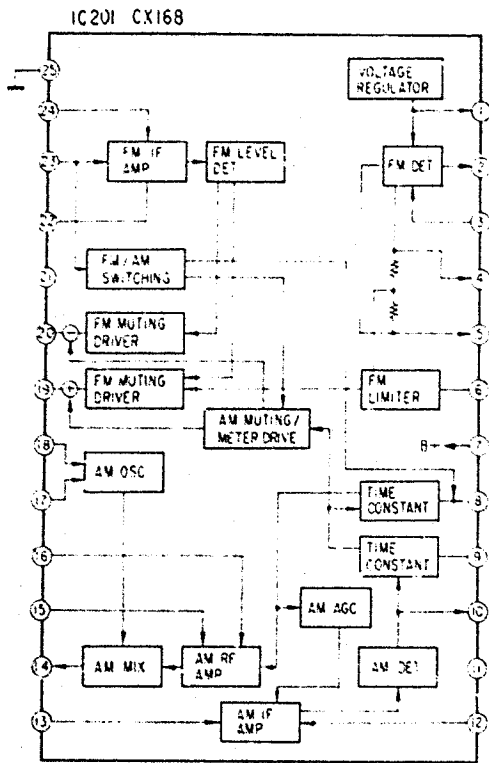
1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT201 clockwise or counterclockwise and memorize the lighting-up range of STEREO lamp.
3. Secure RT201 at the center in lighting-up range of both turns as shown below.



1. Tune the set to 98 MHz.
2. Adjust RT201 for 76 kHz  $\pm$ 100Hz on the counter.



• IC Block Diagram



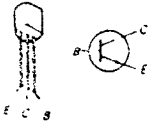
**SECTION 4  
DIAGRAMS**

**4-1. MOUNTING DIAGRAM**

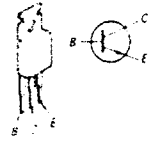
— Conductor Side —

- IC Block Diagram: See page 15.
- Replacement Semiconductors  
For replacement, use semiconductors except in ( ).

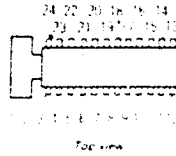
**Q201**  
Q501, 502: 2SC1345  
Q551, 552



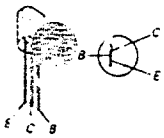
**Q701: 2SC1173**



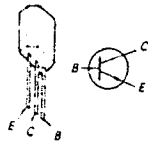
**IC201: CX168**



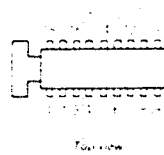
**Q202**  
Q401, 402: 2SC1364  
Q404, 406



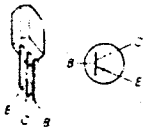
(2SC1633)



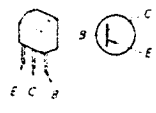
**IC202: CX178**



**Q403, 405: 2SA678**



(2SA844)



**IC401, 402: SPI 201**



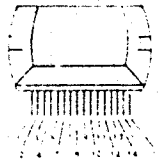
**D201-204**  
D401-408: 1S1555



**D601: EQB01-07**  
(EQA01-07R)  
**D702: EQB01-15**  
(EQA01-15R)



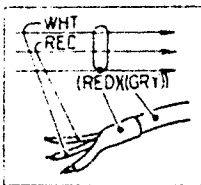
**IC601: S11125HD**



**D701: S2VB20**

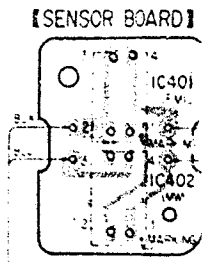
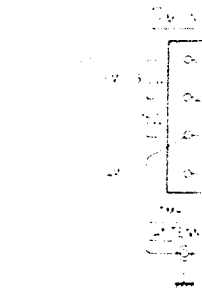
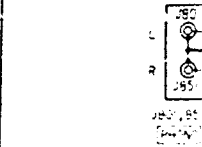


- Note
- indicates side identified with part number.
  - part mounted on the conductor side.
  - Color code of sleeving over the end of the jacket.

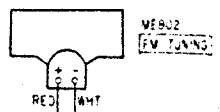
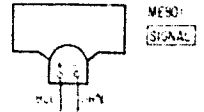


- B + pattern
- B - pattern
- Signal Path
  - : L-CH
  - - -→ : R-CH
- Readings are taken under no signal (detuned) conditions with a VOM (20 kΩ/V).
- ( ) : AM
- ( ) : FM STEREO
- ( ) : PROGRAM FM
- ( ) : PROGRAM MW
- no mark : FM

D	Q, IC
	501,502
701	551,552
	IC601
601	701
201	IC201
702	201
401	405,403 IC202 IC401,404 401,402
203	202 IC402
402	406,408 407 405
	406
D	Q, IC



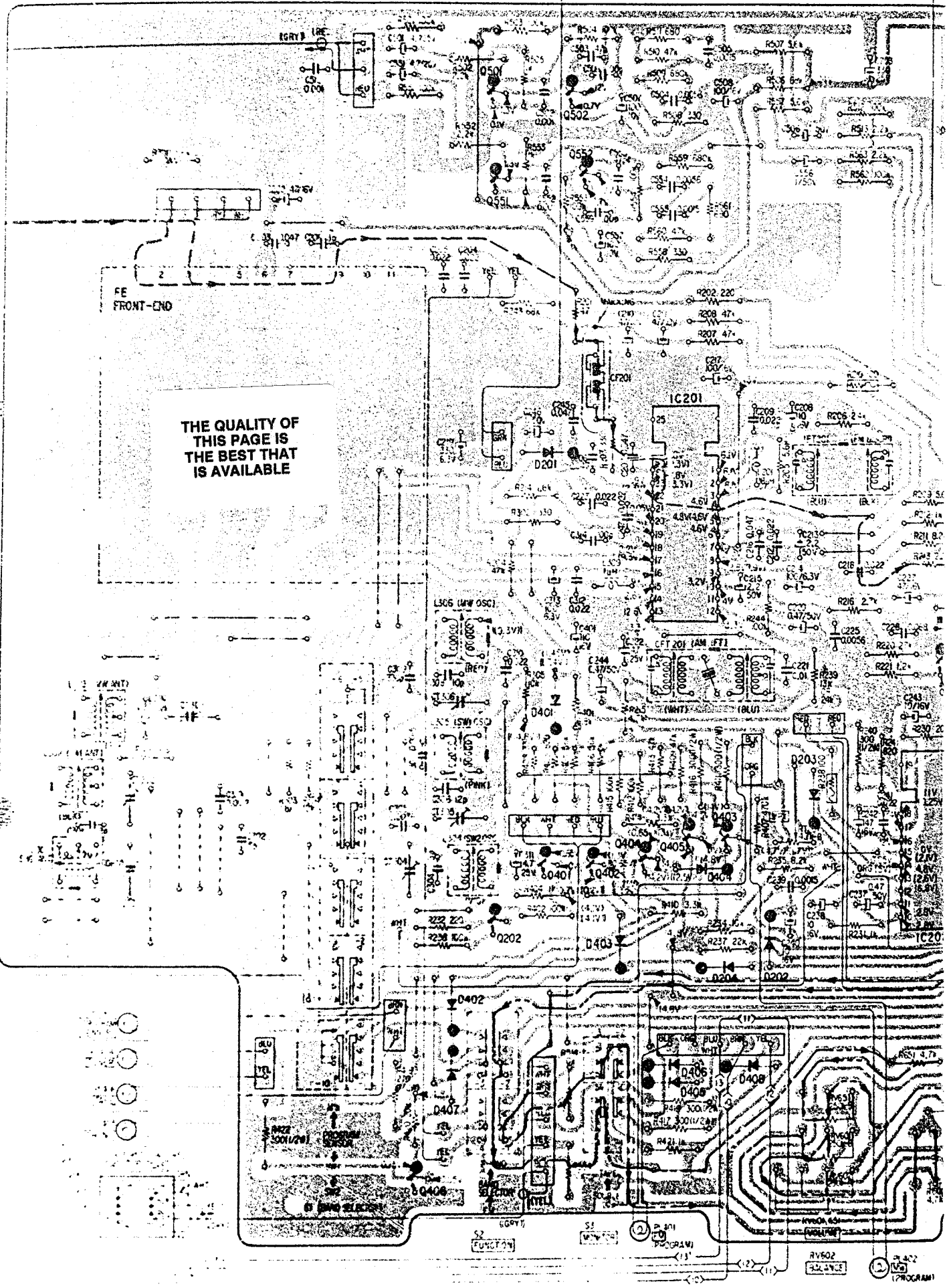
【MAIN BOARD】

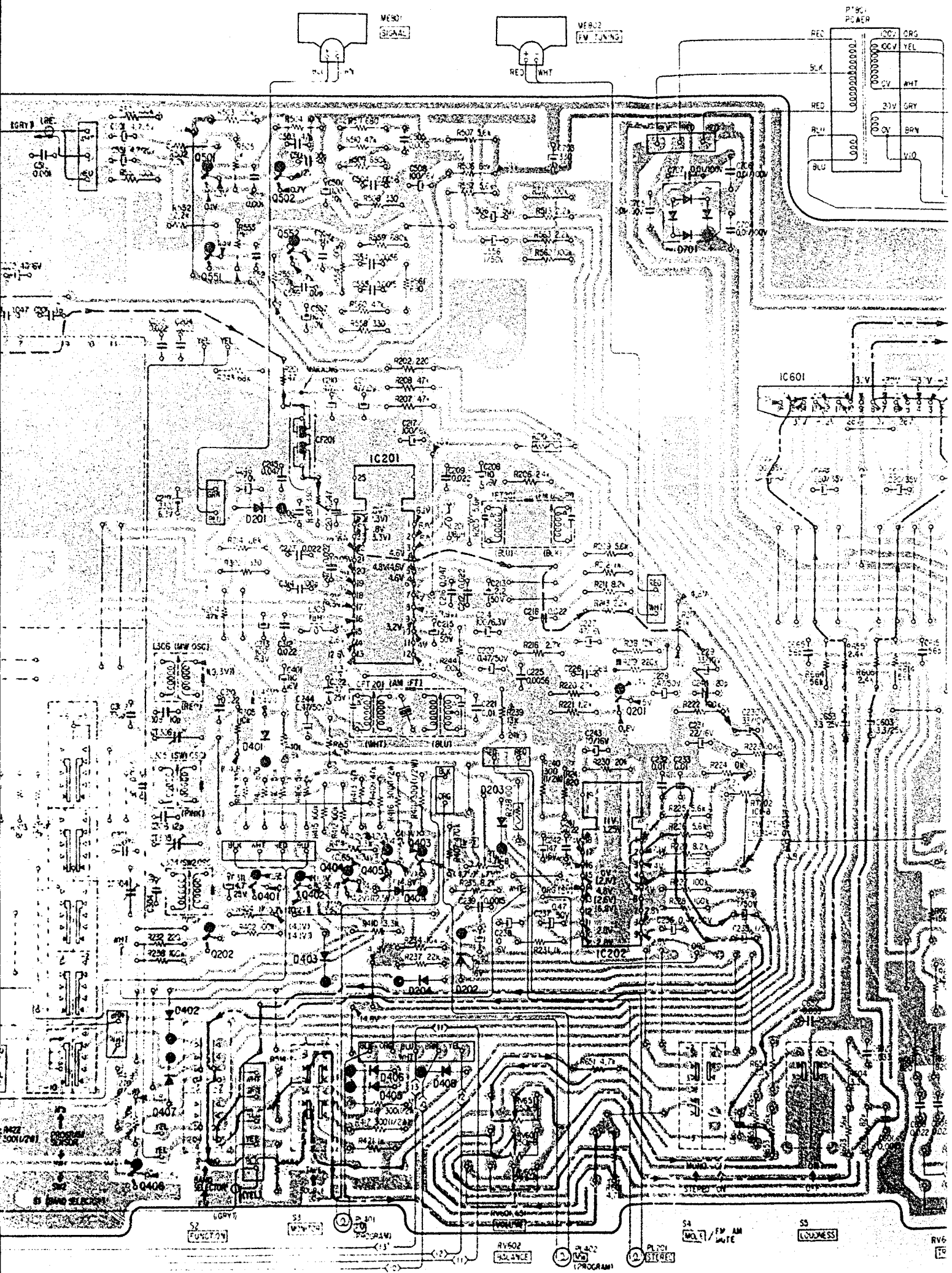


FE FRONT-END

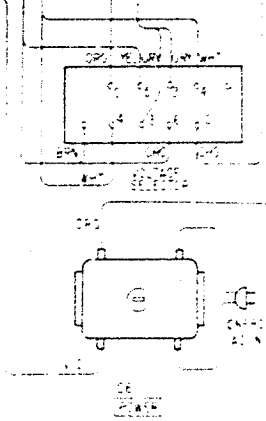
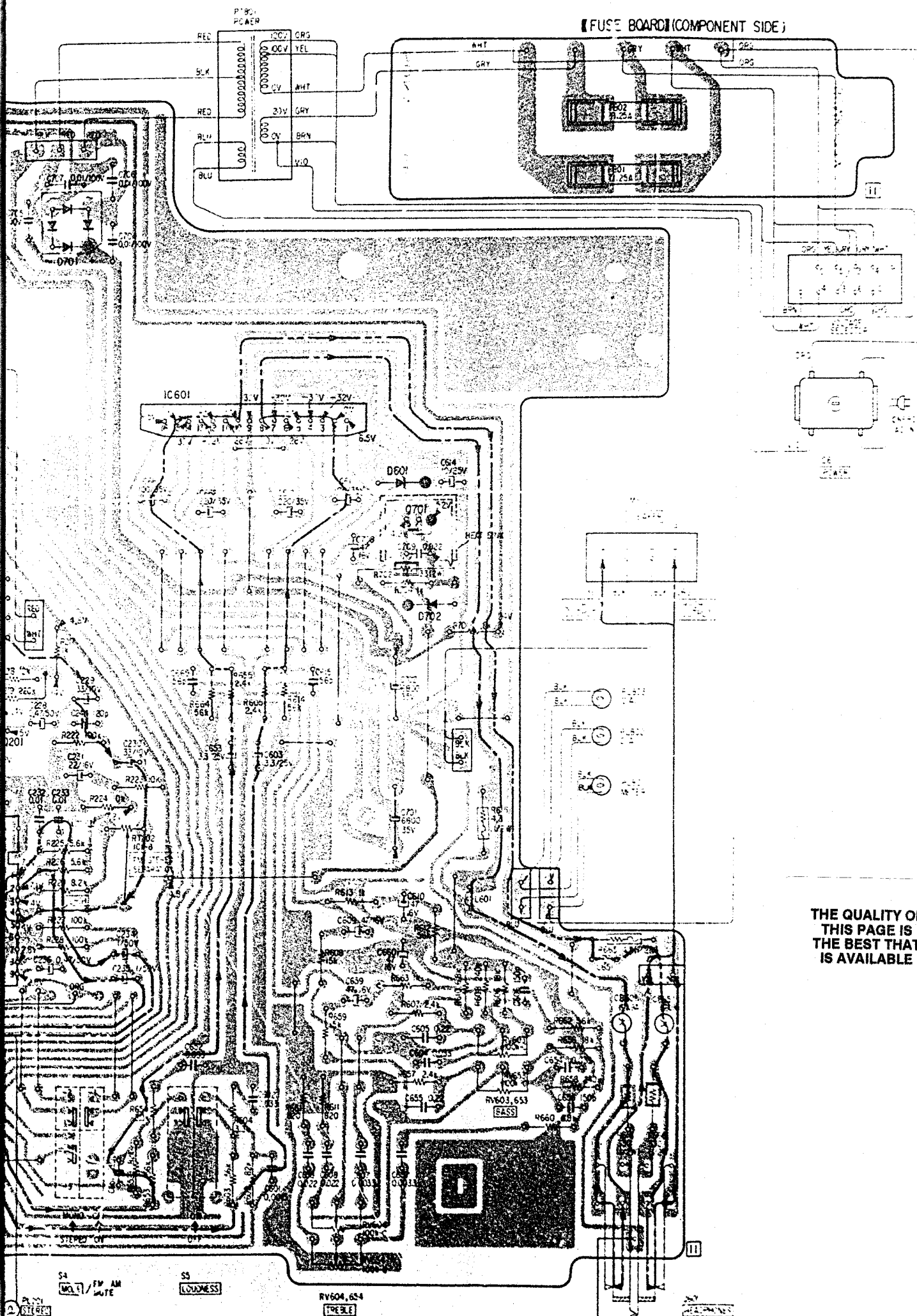
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SC-101



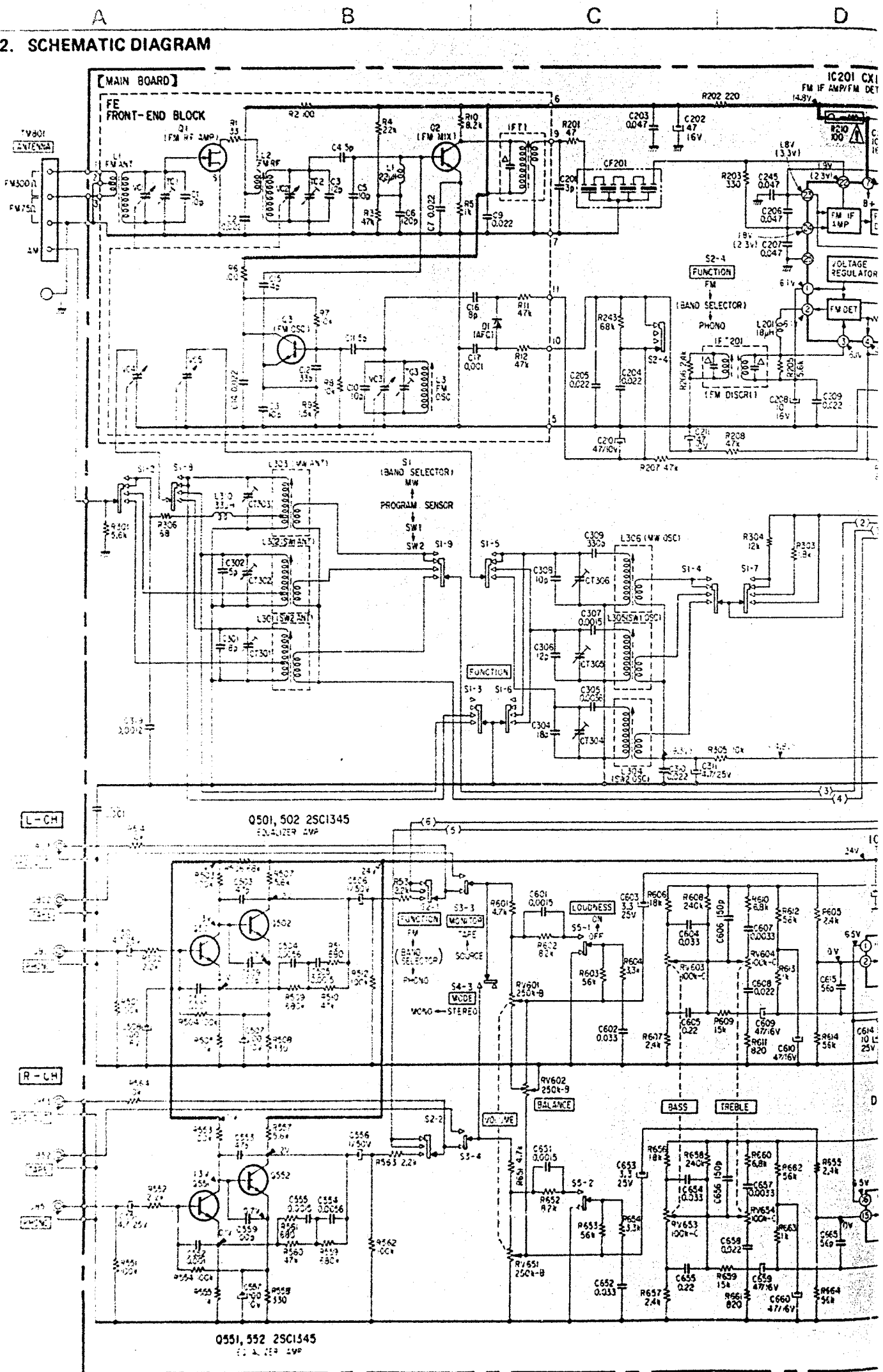


【 FUSE BOARD (COMPONENT SIDE) 】

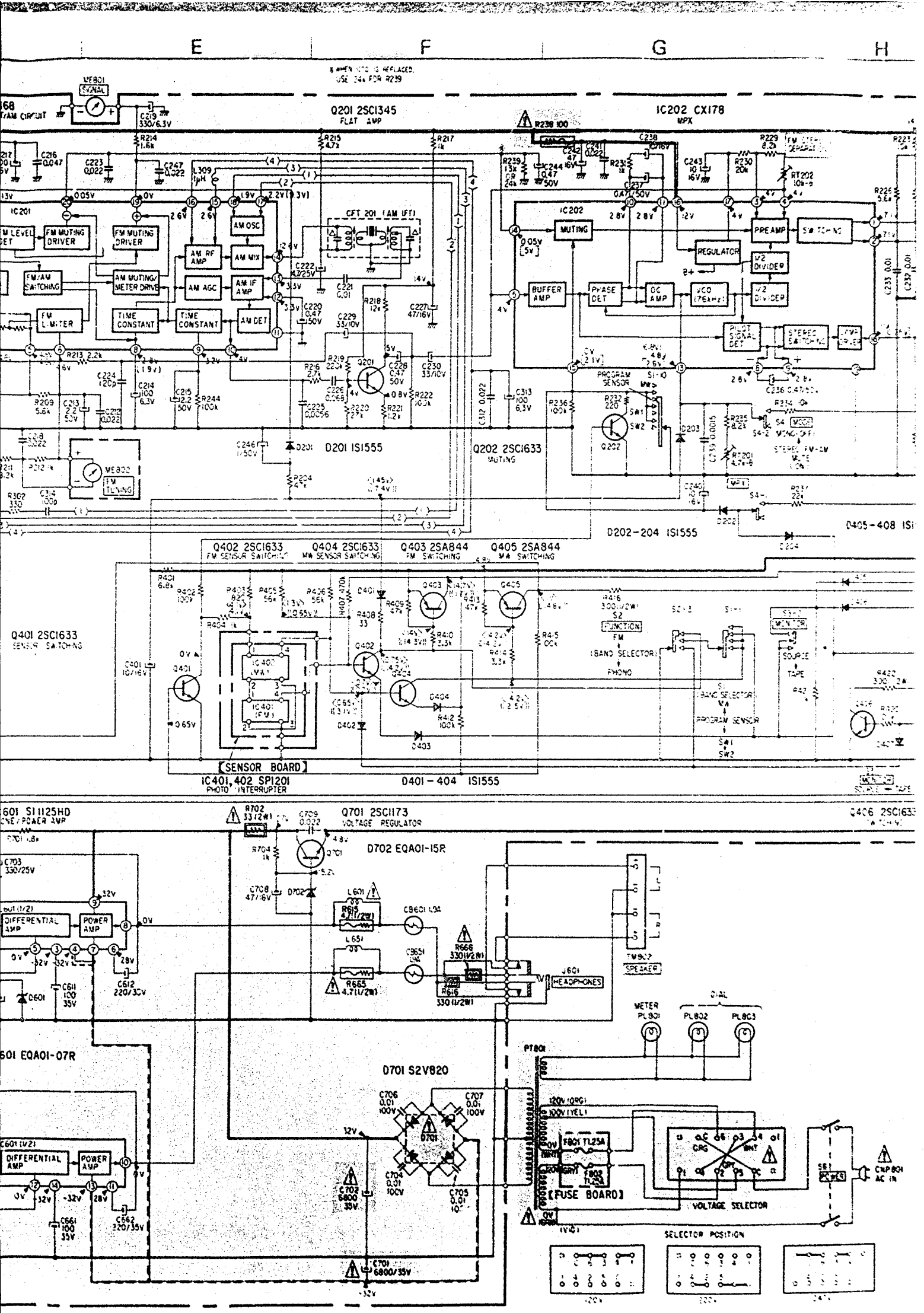


THE QUALITY OF THIS PAGE IS THE BEST THAT IS AVAILABLE

# 4-2. SCHEMATIC DIAGRAM

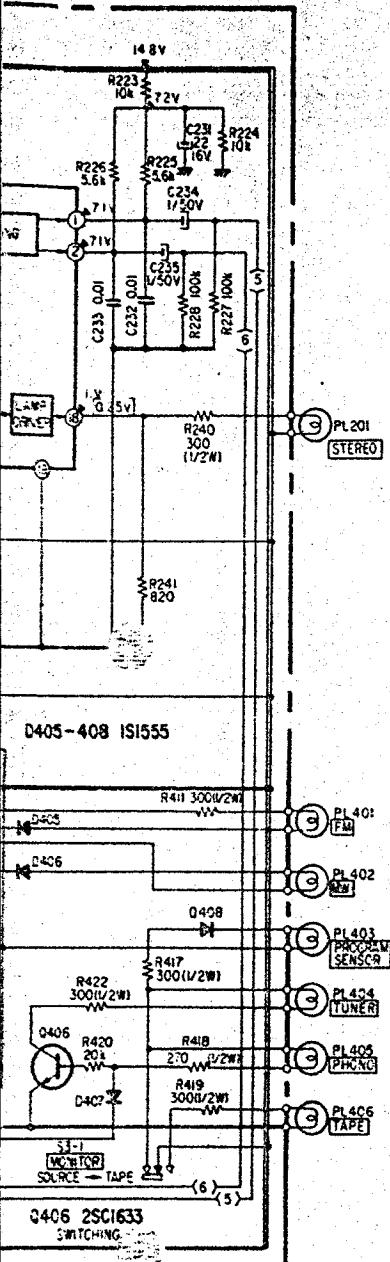








H



- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} = \mu\mu\text{F}$ . 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted.  $\text{k}\Omega = 1000 \Omega$ ;  $\text{M}\Omega = 1000 \text{k}\Omega$ .
- : fusible resistor.
- : nonflammable resistor.
- : B+ bus.
- : B- bus.
- : panel designation.
- : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (20  $\text{k}\Omega/\text{V}$ ).
  - ( ) : AM
  - [ ] : FM STEREO
  - < > : PROGRAM FM
  - (( )) : PROGRAM M/W
  - no mark : FM

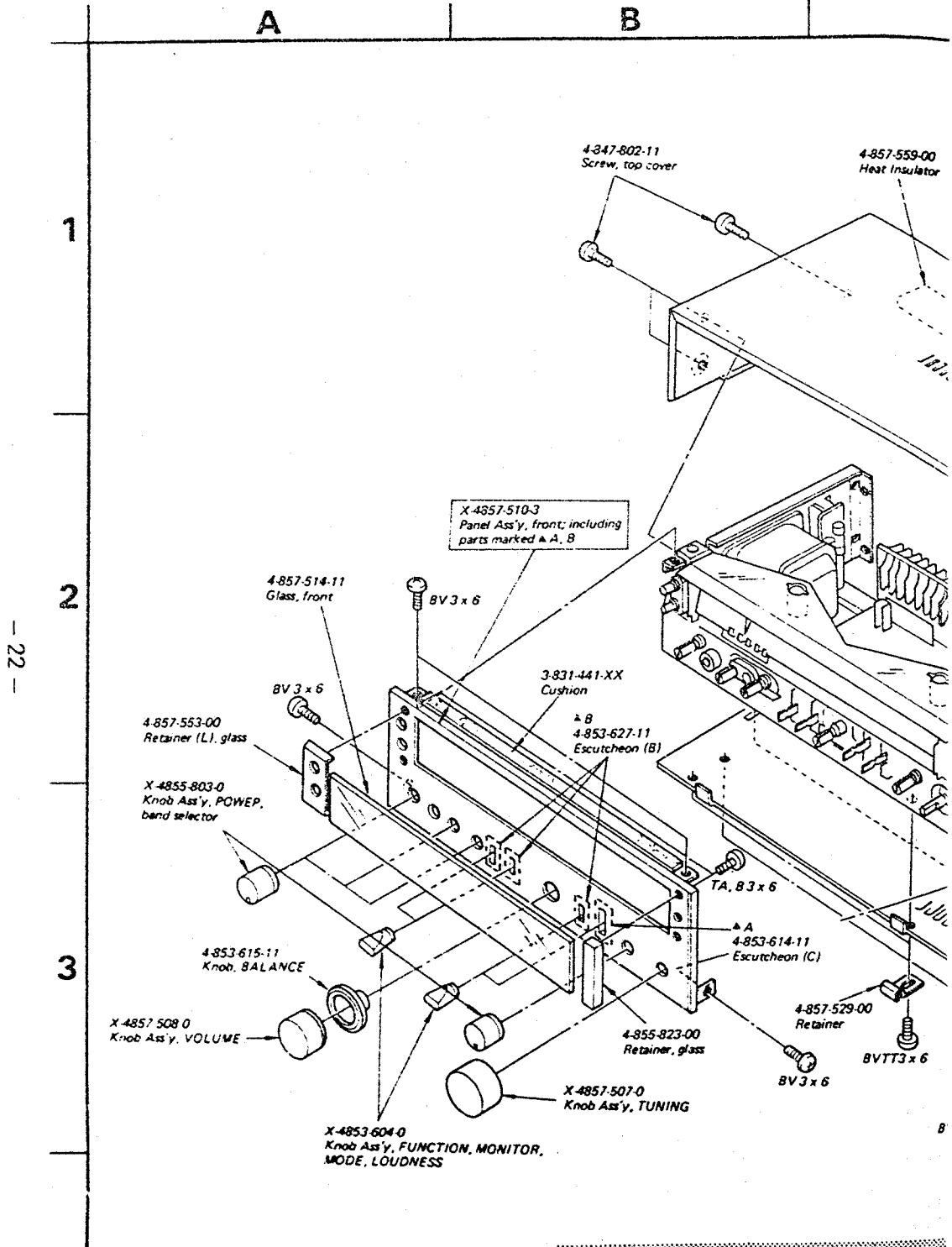
• Voltage variations may be noted due to normal production tolerances.


• Switch

Ref. No.	Switch	Position
S1	Band Selector	PROGRAM SENSOR
S2	FUNCTION	FM
S3	MONITOR	SOURCE
S4	MODE	STEREO
S5	LOUDNESS	OFF
S6	POWER	OFF

**Note:** The components identified by shading and mark are critical for safety. Replace only with part number specified.





Note: The components identified by  are critical for safety. part number specified.

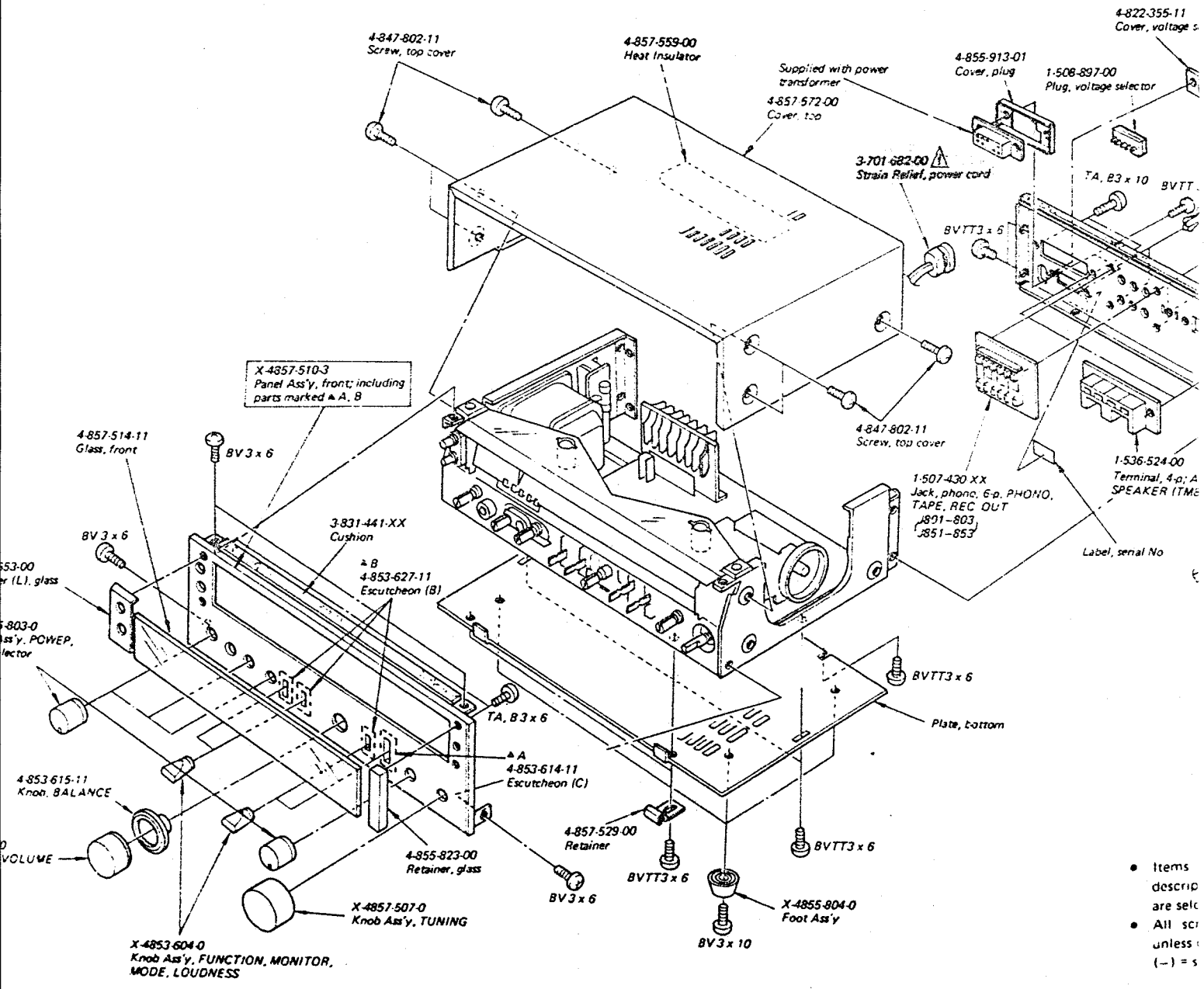
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**MAURITRON SERVICES**  
 8 Cherry Tree Road, Chinnor  
 Oxfordshire, OX9 4QY,  
 Tel (01844) 351694  
 Fax (01844) 352664  
 email: mauritron@dial.pipex.com

A

B

C

D

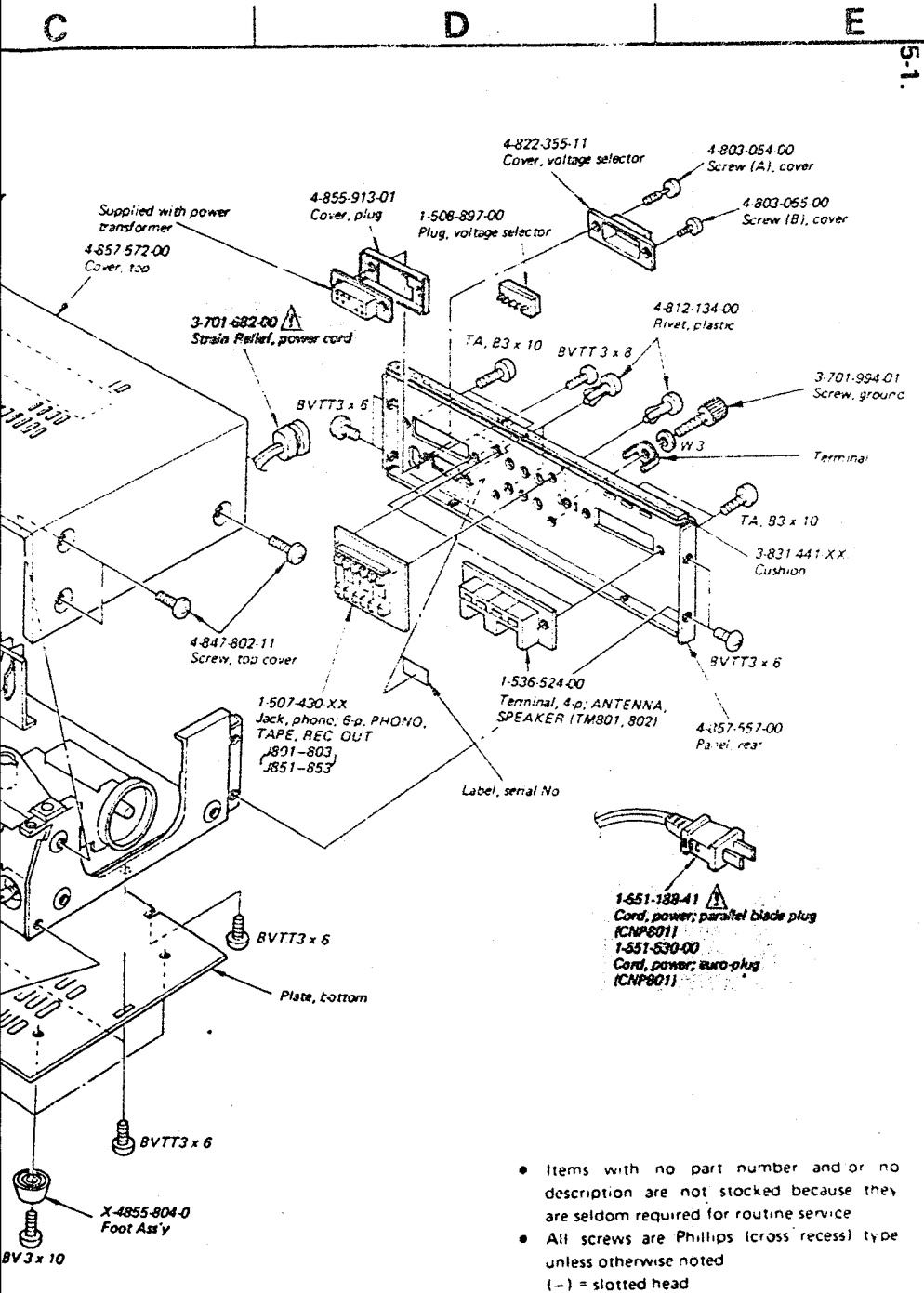


- Items described are selected
- All screws unless specified (-) = 5

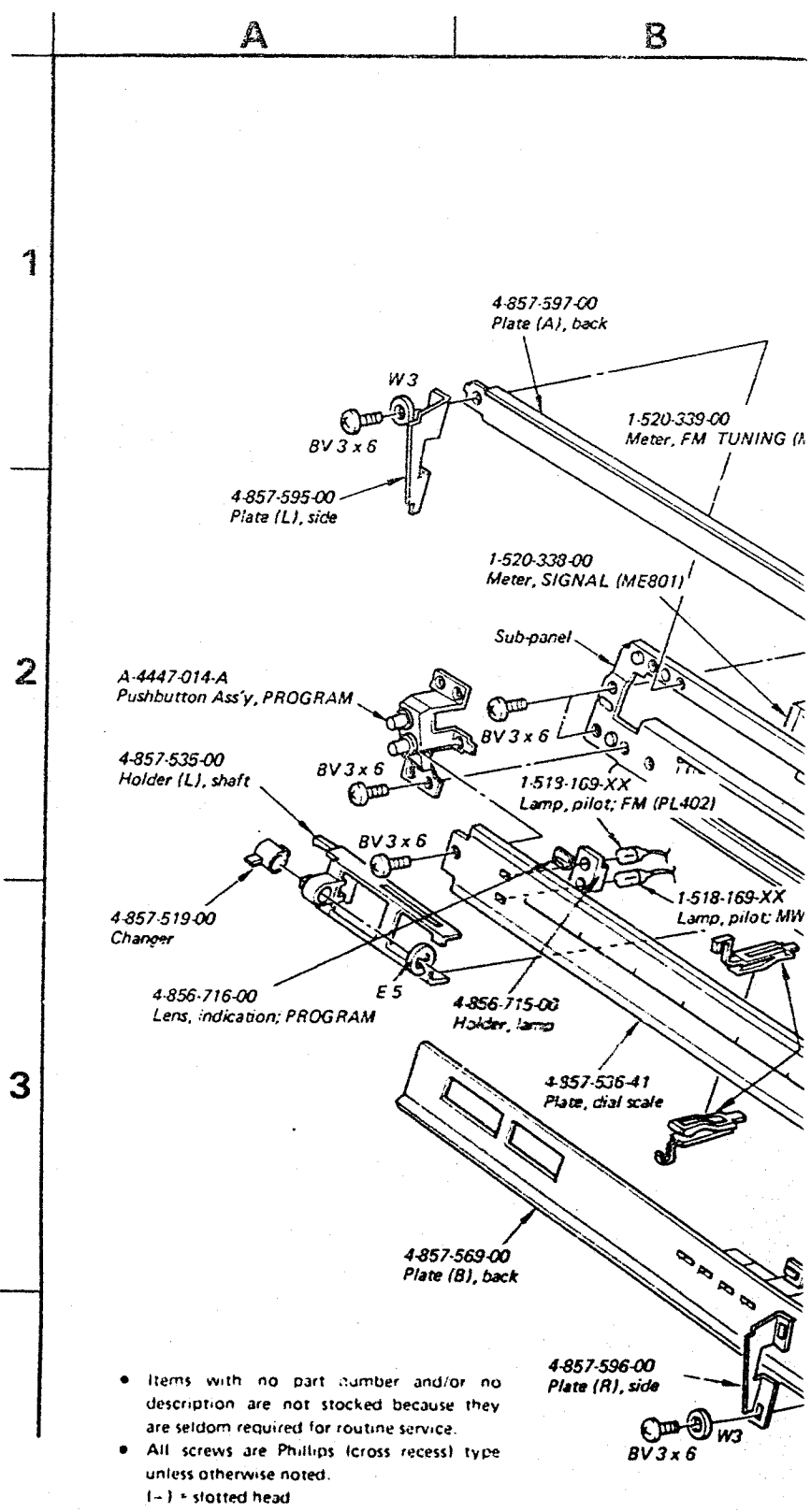
**Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.**

# STR-3135

## SECTION 5 EXPLODED VIEWS



by shading and mark  
Replace only with



- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- [-] = slotted head

A

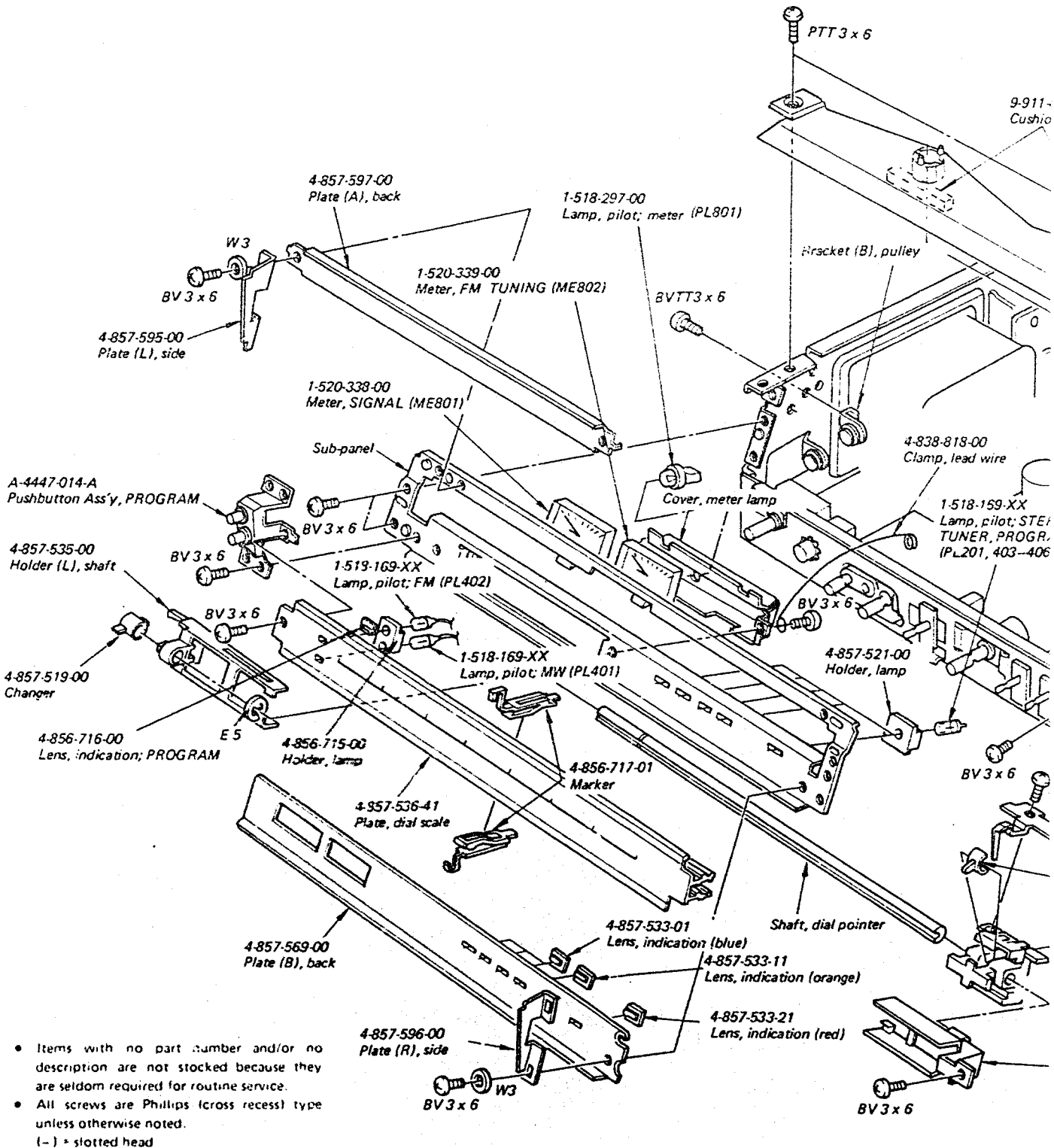
B

C

1

2

3



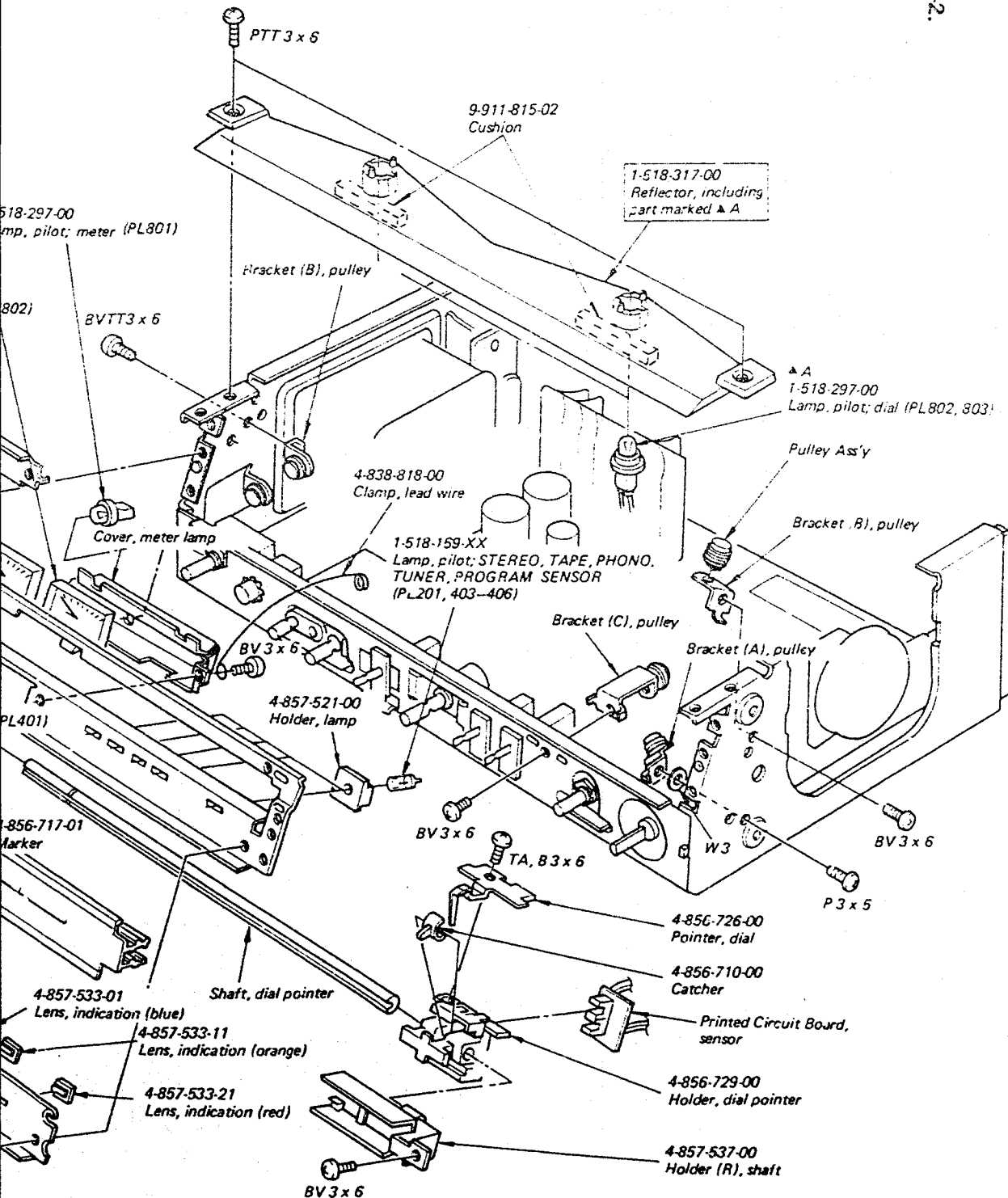
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

C

D

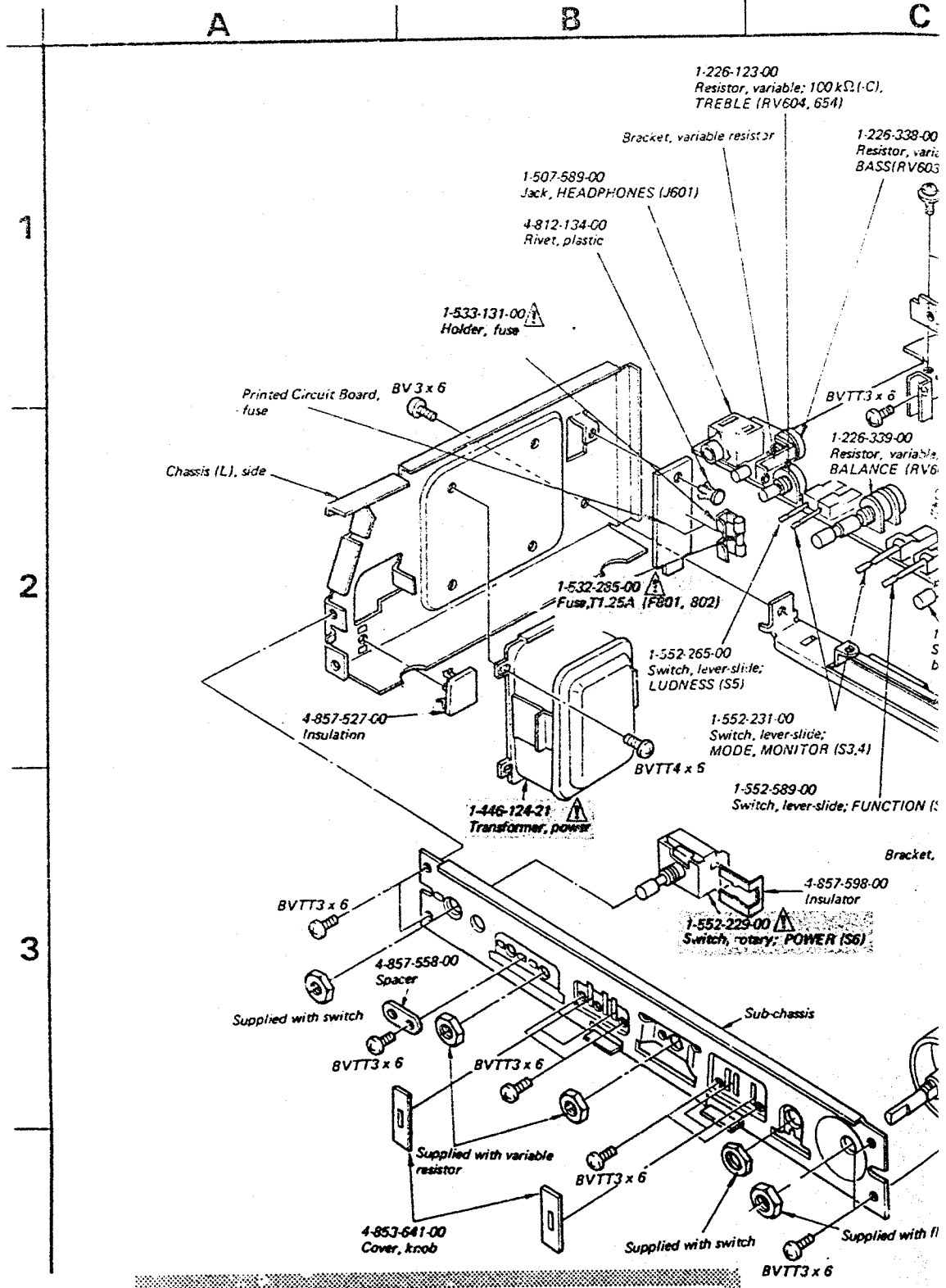
E

5-2.



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 email: mauritron@dial.pipex.com

**STR-313S**



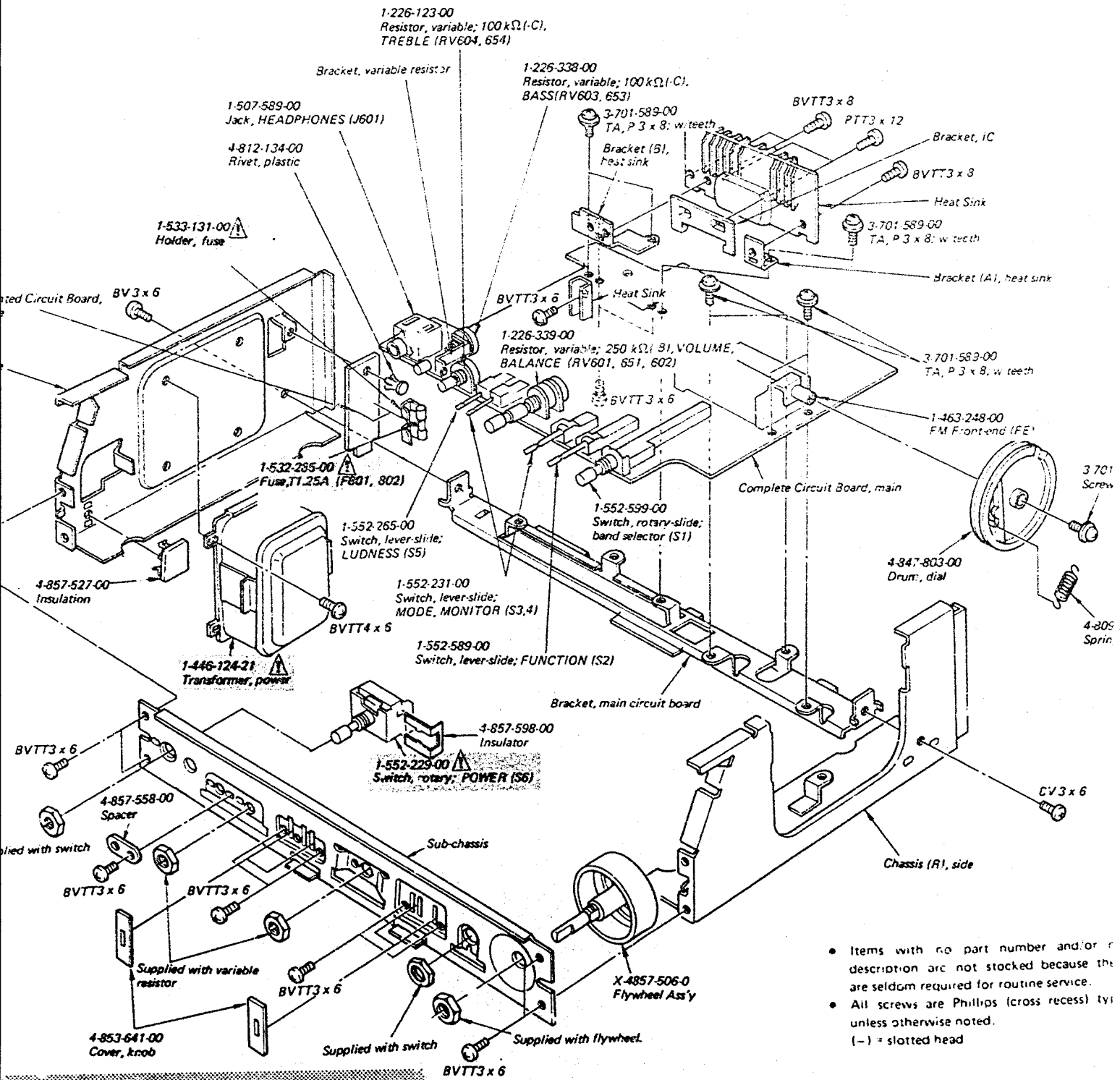
**Note:** The components identified by shading and mark are critical for safety. Replace only with part number specified.



B

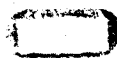
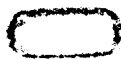
C

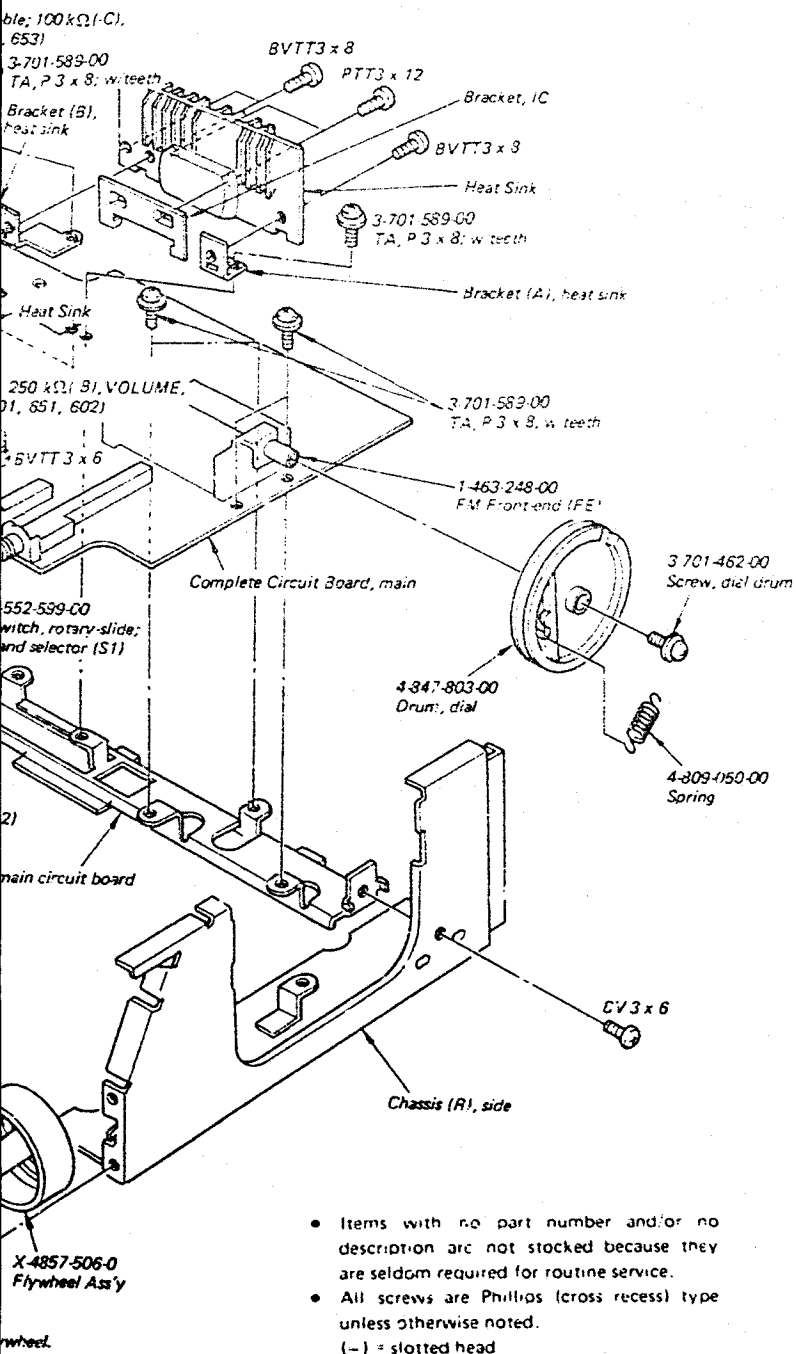
D



- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

Components identified by shading and mark are critical for safety. Replace only with part number specified.





- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head

# SECTION 6 ELECTRICAL PARTS LIST

**STR-3135**

Ref. No.    Part No.    Description

### SEMICONDUCTORS

#### Transistors

Q201	8-729-334-58	2SC1345
⇒ Q202	8-729-663-47	2SC1364
⇒ Q401,402	8-729-663-47	2SC1364
⇒ Q403	8-727-788-00	2SA678
⇒ Q404	8-729-663-47	2SC1364
⇒ Q405	8-727-788-00	2SA678
⇒ Q406	8-729-663-47	2SC1364
Q501,551 )	8-729-334-58	2SC1345
Q502,552 )		
Q701	8-729-217-33	2SC1173

#### ICs

IC201	8-751-680-01	CX168
IC202	8-751-780-00	CX178
IC401,402	8-719-902-01	SPI201
IC601	8-759-301-25	SI1125HD

#### Diodas

D201-204 )	8-719-815-55	1S1555
D401-408 )		
⇒ D601	8-719-931-07	EQB01-07
<b>D701</b>	<b>8-719-502-20</b>	<b>S2VB20</b>
⇒ D702	8-719-931-15	EQB01-15

#### COILS

L201	1-407-741-00	18μH, microinductor
L301	1-401-746-00	SW2 Ant
L302	1-401-745-00	SW1 Ant
L303	1-401-728-00	MW Ant
L304	1-405-816-00	SW2 Osc
L305	1-405-815-00	SW1 Osc
L306	1-405-797-00	MW Osc

Ref. No.    Part No.    Description

### TRANSFORMERS

CFT201	1-404-036-00	AM IFT
IFT201	1-404-011-00	FM Discriminator
<b>PT801</b>	<b>1-446-124-21</b>	<b>Power</b>

### CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.  
50WV or less are not indicated except for electrolytics.  
pF = μμF, elect = electrolytic

C201	1-102-936-11	3P		
C202	1-121-409-11	47	16V	elect
C203	1-101-006-11	0.047		
C204,205	1-101-005-11	0.022		
C206,207	1-101-006-11	0.047		
C208	1-121-651-11	10	16V	elect
C209	1-101-005-11	0.022		
C210,211	1-121-352-11	47	10V	elect
C212	1-101-005-11	0.022		
C213	1-121-450-11	2.2	50V	elect
C214	1-121-314-11	100	6.3V	elect
C215	1-121-450-11	2.2	50V	elect
C216	1-101-006-11	0.047		
C217	1-121-415-11	100	16V	elect
C218	1-101-005-11	0.022		
C219	1-121-751-11	330	6.3V	elect
C220	1-121-726-11	0.47	50V	elect
C221	1-101-004-11	0.01		
C222	1-121-395-11	4.7	25V	elect
C223	1-101-005-11	0.022		
C224	1-102-816-11	120p		
C225	1-108-355-12	0.0056		mylar
C226	1-108-249-11	0.068		mylar
C227	1-121-409-11	47	16V	elect
C228	1-121-726-11	0.47	50V	elect
C229,230	1-121-403-11	33	10V	elect
C231	1-121-479-11	22	16V	elect

• ⇒ : Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

**Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.**

# STR-313S

Ref. No.	Part No.	Description
C232,233	1-108-239-12	0.01 mylar
C234,235	1-121-391-11	1 50V elect
C236,237	1-121-726-11	0.47 50V elect
C238	1-121-651-11	10 16V elect
C239	1-104-081-11	0.0015 polystyrol
C240	1-121-651-11	10 16V elect
C241	1-101-005-11	0.022
C242	1-121-409-11	47 16V elect
C243	1-121-651-11	10 16V elect
C244	1-121-726-11	0.47 50V elect
C245	1-101-006-11	0.047
C246	1-121-391-11	1 50V elect
C247	1-101-005-11	0.022
C301	1-102-953-11	18p
C302	1-102-942-11	5p
C304	1-102-295-11	18p
C305	1-103-738-11	0.0036 polystyrol
C306	1-102-262-11	12p
C307	1-104-081-11	0.0015 polystyrol
C308	1-102-997-11	10p
C309	1-103-713-11	330p polystyrol
C310	1-101-005-11	0.022
C311	1-121-395-11	4.7 25V elect
C312	1-101-005-11	0.022
C313	1-121-414-11	100 6.3V elect
C314	1-102-973-11	100p
C319	1-102-118-11	0.0012
C401	1-121-651-11	10 16V elect
C501,551	1-121-915-11	4.7 25V elect
C502,552	1-101-001-11	0.001
C503,553	1-101-880-11	47p
C504,554	1-108-355-12	0.0056 mylar
C505,555	1-108-228-12	0.0015 mylar
C506,556	1-121-391-11	1 50V elect

Ref. No.	Part No.	Description
C507,557	1-121-414-11	100 10V elect
C508	1-121-415-11	100 16V elect
C509,559	1-102-973-11	100p
C510	1-101-001-11	0.001
C601,651	1-108-228-12	0.0015 mylar
C602,652	1-108-244-12	0.033 mylar
C603,653	1-121-392-11	3.3 5V elect
C604,654	1-108-244-12	0.033 mylar
C605,655	1-108-254-12	0.22 mylar
C606,656	1-101-361-11	150p
C607,657	1-108-232-12	0.0033 mylar
C608,658	1-108-242-12	0.022 mylar
C609,659	1-121-409-11	47 16V elect
C610,660	1-121-409-11	47 16V elect
C611,661	1-123-062-11	100 35V elect
C612,662	1-121-655-11	220 35V elect
C614	1-121-398-11	10 25V elect
C615,665	1-101-884-11	56p
<b>C701,702</b>	<b>Δ 1-125-155-11</b>	<b>6800 35V elect</b>
C703	1-121-657-11	330 25V elect
C704-707	1-108-377-12	0.01 100V mylar
C708	1-121-409-11	47 16V elect
C709	1-101-005-11	0.022
CT301-306	1-141-171-00	trimmer

## RESISTORS


All resistors are in ohms. Common 1/4W carbon resistors are omitted. Refer to the list on the last page for their part numbers.

<b>R210,238</b>	<b>Δ 1-212-881-11</b>	<b>100</b>	<b>1/4W</b>	<b>fusible</b>
R240	1-244-860-11	300	1/2W	carbon
R411	1-244-860-11	300	1/2W	carbon
R416,417				
R418	1-244-859-11	270	1/2W	carbon
R419,422	1-244-860-11	300	1/2W	carbon
<b>R61,653</b>	<b>Δ 1-212-950-11</b>	<b>47</b>	<b>1/2W</b>	<b>fusible</b>
<b>R66</b>	<b>Δ 1-212-826-11</b>	<b>220</b>	<b>1/2W</b>	<b>carbon (nonflammable)</b>
<b>R67</b>	<b>Δ 1-212-826-11</b>	<b>220</b>	<b>1/2W</b>	<b>carbon (nonflammable)</b>




**Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.**

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RT201	1-224-644-XX	4.7k-B adjustable, MPX
RT202	1-224-645-XX	10k-B adjustable, FM stereo separation
RV601,602 RV651	1-226-339-00	250k-B, variable: VOLUME BALANCE
RV603, 653	1-226-338-00	100k-C, variable: BASS
RV604, 654	1-226-123-00	100k-C, variable: TREBLE

## SWITCHES


S1	1-552-599-00	Rotary-slide, band selector
S2	1-552-589-00	Lever-slide, FUNCTION
S3, 4	1-552-231-00	Lever-slide, MONITOR, MODE
S5	1-552-265-00	Lever-slide, LOUDNESS
S6	 1-552-229-00	Rotary, POWER

## MISCELLANEOUS

CB601,651	1-532-380-61	Circuit Breaker, 1.9A
CF201	1-527-346-00	Filter, ceramic
CNP801	 1-551-188-41	Cord, power; parallel blade plug
	1-551-530-00	Cord, power; euro-plug
F801,802	 1-532-285-00	Fuse, T1.25A
FE	1-463-248-00	FM Front-end
J601	1-507-589-00	Jack, HEADPHONES
J801-803 J851-853	1-507-430-XX	Jack, phono; 6p
MES	1-520-338-00	Meter, SIGNAL
ME802	1-520-339-00	Meter, FM TUNING
PL201 PL401-406	1-518-169-XX	Lamp, STEREO, FM, MW, PROGRAM SENSOR, TUNER, PHONO, TAPE
PL801-803	1-518-297-00	Lamp, meter, dial
TM801,802	1-536-524-00	Terminal, 4p; ANTENNA, SPEAKER
	1-508-897-00	Plug, voltage selector
	1-518-317-00	Reflector, w/lamp
	 1-533-131-00	Holder, fuse

## ACCESSORIES AND PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>
1-501-184-00	Antenna, ribbon; FM
1-501-193-00	Antenna Wire, AM
3-701-630-00	Bag, plastic
3-770-593-51	Manual, instruction
4-857-573-00	Cushion, lower (left)
4-857-574-00	Cushion, lower (right)
4-857-575-00	Cushion, upper
4-857-578-00	Carton
4-857-599-41	Card, instruction: AM antenna
4-891-037-00	Bag, plastic

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

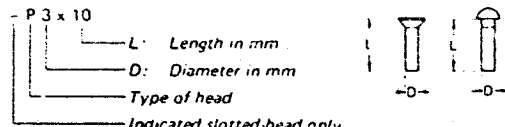
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1/4 WATT CARBON RESISTORS

$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.		
1.0	1-244-601-11	10	1-244-625-11	100	1-244-649-11	1.0k	1-244-673-11	10k	1-244-697-11	100k	1-244-721-11	1.0M	1-244-745-11
1.1	1-244-602-11	11	1-244-626-11	110	1-244-650-11	1.1k	1-244-674-11	11k	1-244-698-11	110k	1-244-722-11	1.1M	1-244-746-11
1.2	1-244-603-11	12	1-244-627-11	120	1-244-651-11	1.2k	1-244-675-11	12k	1-244-699-11	120k	1-244-723-11	1.2M	1-244-747-11
1.3	1-244-604-11	13	1-244-628-11	130	1-244-652-11	1.3k	1-244-676-11	13k	1-244-700-11	130k	1-244-724-11	1.3M	1-244-748-11
1.5	1-244-605-11	15	1-244-629-11	150	1-244-653-11	1.5k	1-244-677-11	15k	1-244-701-11	150k	1-244-725-11	1.5M	1-244-749-11
1.6	1-244-606-11	16	1-244-630-11	160	1-244-654-11	1.6k	1-244-678-11	16k	1-244-702-11	160k	1-244-726-11	1.6M	1-244-750-11
1.8	1-244-607-11	18	1-244-631-11	180	1-244-655-11	1.8k	1-244-679-11	18k	1-244-703-11	180k	1-244-727-11	1.8M	1-244-751-11
2.0	1-244-608-11	20	1-244-632-11	200	1-244-656-11	2.0k	1-244-680-11	20k	1-244-704-11	200k	1-244-728-11	2.0M	1-244-752-11
2.2	1-244-609-11	22	1-244-633-11	220	1-244-657-11	2.2k	1-244-681-11	22k	1-244-705-11	220k	1-244-729-11	2.2M	1-244-753-11
2.4	1-244-610-11	24	1-244-634-11	240	1-244-658-11	2.4k	1-244-682-11	24k	1-244-706-11	240k	1-244-730-11	2.4M	1-244-754-11
2.7	1-244-611-11	27	1-244-635-11	270	1-244-659-11	2.7k	1-244-683-11	27k	1-244-707-11	270k	1-244-731-11	2.7M	1-244-755-11
3.0	1-244-612-11	30	1-244-636-11	300	1-244-660-11	3.0k	1-244-684-11	30k	1-244-708-11	300k	1-244-732-11	3.0M	1-244-756-11
3.3	1-244-613-11	33	1-244-637-11	330	1-244-661-11	3.3k	1-244-685-11	33k	1-244-709-11	330k	1-244-733-11	3.3M	1-244-757-11
3.6	1-244-614-11	36	1-244-638-11	360	1-244-662-11	3.6k	1-244-686-11	36k	1-244-710-11	360k	1-244-734-11	3.6M	1-244-758-11
3.9	1-244-615-11	39	1-244-639-11	390	1-244-663-11	3.9k	1-244-687-11	39k	1-244-711-11	390k	1-244-735-11	3.9M	1-244-759-11
4.3	1-244-616-11	43	1-244-640-11	430	1-244-664-11	4.3k	1-244-688-11	43k	1-244-712-11	430k	1-244-736-11	4.3M	1-244-760-11
4.7	1-244-617-11	47	1-244-641-11	470	1-244-665-11	4.7k	1-244-689-11	47k	1-244-713-11	470k	1-244-737-11	4.7M	1-244-761-11
5.1	1-244-618-11	51	1-244-642-11	510	1-244-666-11	5.1k	1-244-690-11	51k	1-244-714-11	510k	1-244-738-11	5.1M	1-244-762-11
5.6	1-244-619-11	56	1-244-643-11	560	1-244-667-11	5.6k	1-244-691-11	56k	1-244-715-11	560k	1-244-739-11		
6.2	1-244-620-11	62	1-244-644-11	620	1-244-668-11	6.2k	1-244-692-11	62k	1-244-716-11	620k	1-244-740-11		
6.8	1-244-621-11	68	1-244-645-11	680	1-244-669-11	6.8k	1-244-693-11	68k	1-244-717-11	680k	1-244-741-11		
7.5	1-244-622-11	75	1-244-646-11	750	1-244-670-11	7.5k	1-244-694-11	75k	1-244-718-11	750k	1-244-742-11		
8.2	1-244-623-11	82	1-244-647-11	820	1-244-671-11	8.2k	1-244-695-11	82k	1-244-719-11	820k	1-244-743-11		
9.1	1-244-624-11	91	1-244-648-11	910	1-244-672-11	9.1k	1-244-696-11	91k	1-244-720-11	910k	1-244-744-11		

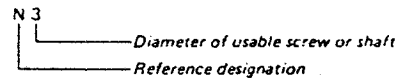
HARDWARE NOMENCLATURE

Screw:



Indicated slotted-head only.  
Unless otherwise indicated, it means cross-recessed head (Phillips type).

Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
<b>SCREWS</b>			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-filister-head screw	
RF		filister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
<b>SELF-TAPPING SCREWS</b>			
TA		self-tapping screw	ex. TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
<b>SET SCREWS</b>			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
<b>NUT</b>			
N		nut	
<b>WASHERS</b>			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
<b>RETAINING RINGS</b>			
E		retaining ring	
G		grip-type retaining ring	