

**ADDITIONAL**

 **PIONEER®**

# *Service Manual*

**ORDER NO.  
ARP-481-0**

**FM/AM DIGITAL SYNTHESIZED TUNER**

# **TX-950**

**HEZ, YP, S,  
S/G, SS**

Type	Voltage	Remarks
HEZ	AC220V, 240V (switchable)	West Germany model
YP	AC240V only	Australia model
S	AC110V, 120V, 220V, 240V (switchable)	General export model
S/G	AC110V, 120V, 220V, 240V (switchable)	U.S. Military model
SS	AC110V, 120V, 220V, 240V (switchable)	South Africa model

The basic performance of the model TX-950/HEZ, YP, S, S/G and SS is the same as the model TX-950/KU. Please refer to TX-950/KU service manual (ARP-472) with the exception of this service manual. This additional service manual is applicable to the TX-950/HEZ, YP, S, S/G and SS model.

# 1. FOR HEZ AND YP TYPES

## NOTES:

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

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

560Ω	56 × 10 <sup>1</sup>	561 . . . . .	RD½PS	561 J
47kΩ	47 × 10 <sup>3</sup>	473 . . . . .	RD½PS	473 J
0.5Ω	0R5 . . . . .		RN2H	055 K
1Ω	010 . . . . .		RS1P	010 K

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

5.62kΩ	562 × 10 <sup>1</sup>	5621 . . . . .	RN½SR	5621 F
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- The  $\triangle$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.  
**★★ GENERALLY MOVES FASTER THAN ★**  
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

The HEZ and YP types are the same as the KU type with the exception of the following sections.

## Contrast of Miscellaneous Parts

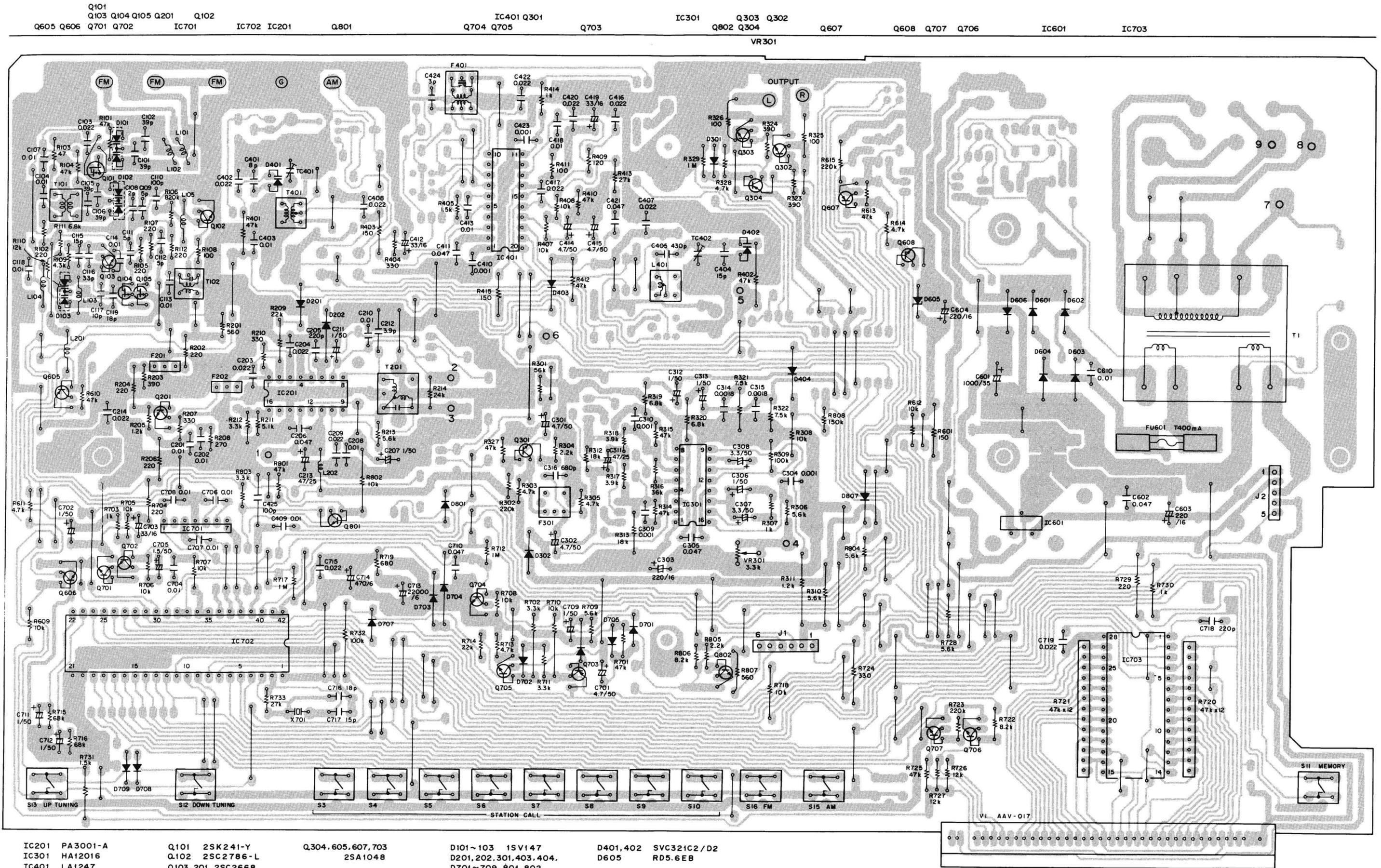
Mark	Symbol & Description	Part No.			Remarks
		KU type	HEZ type	YP type	
$\triangle$ ★★	FU601 Fuse (0.8A/125V)	GWM-346	GWM-358	GWM-358	
	FU601 FUSE (T400mA/250V)	AEK-118	...	...	
$\triangle$ ★★	Operating Instructions (English)	ARB-602	...	ARB-602	
	Operating Instructions (English, French, German, Italian)	...	ARE-101	...	
$\triangle$	Packing case	AHE-332	AHE-354	AHE-354	
	AC power cord	ADG-073	ADG-071	ADG-064	

## Complex Assembly (GWM-358)

The complex assembly GWM-358 (for HEZ and YP types) is the same as the GWM-346 (for KU type) with the exception of the following sections.

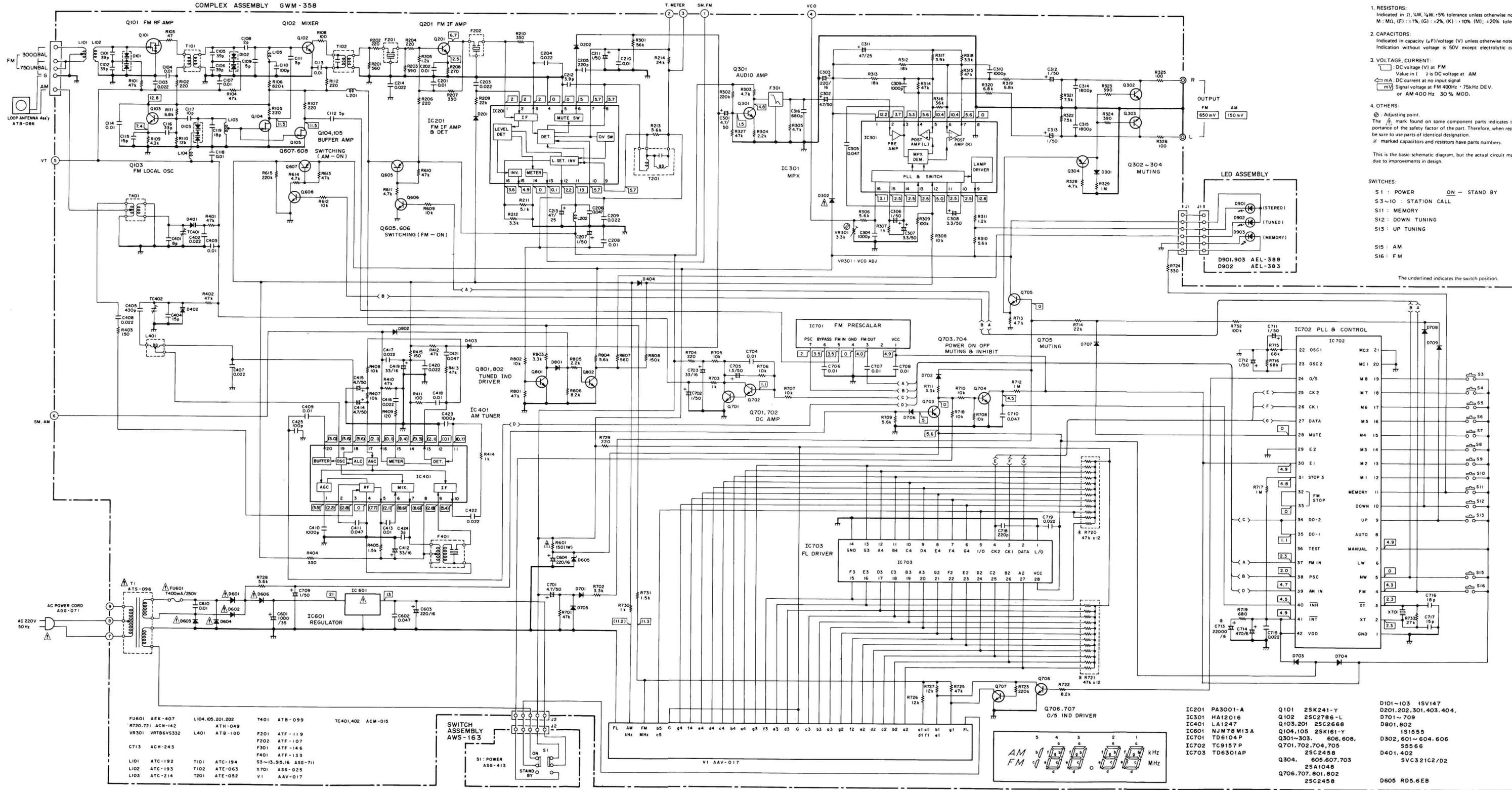
Mark	Symbol & Description	Part No.		Remarks
		GWM-346	GWM-358	
★★	Q305, Q306	2SK246	...	
$\triangle$ ★	T1 Power transformer	ATS-095	ATS-096	
★★	S17 Slide switch	ASH-034	...	
	C317, C318	CKDYB561K50	...	
$\triangle$	R616 Carbon composition	ACN-140	...	
	R330, R331 Terminal (ANTENNA)	RD1/8PM □□□J AKA-017	... AKA-018	

# COMPLEX ASSEMBLY (GWM-358)



# SCHEMATIC DIAGRAM (FOR HEZ AND YP TYPES) TX-950/HEZ

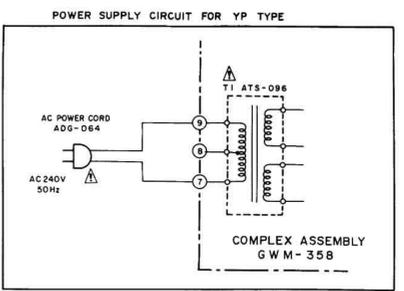
COMPLEX ASSEMBLY GWM-358



- RESISTORS:**  
Indicated in  $\Omega$ ,  $k\Omega$ ,  $M\Omega$ ,  $\frac{1}{2}W$ ,  $\frac{1}{4}W$ ,  $\pm 5\%$  tolerance unless otherwise noted k: k $\Omega$ , M: M $\Omega$ , (F):  $\pm 1\%$ , (G):  $\pm 2\%$ , (K):  $\pm 10\%$  (M):  $\pm 20\%$  tolerance
  - CAPACITORS:**  
Indicated in capacity ( $\mu$ F)/voltage (V) unless otherwise noted p: pF  
Indication without voltage is 50V except electrolytic capacitor.
  - VOLTAGE, CURRENT:**  
    - DC voltage (V) at FM
    - Value in ( ) is DC voltage at AM
    - mA: DC current at no input signal
    - mV: Signal voltage at FM 400Hz  $\pm 75$ Hz DEV.
    - or AM 400 Hz  $\pm 30\%$  MOD.
  - OTHERS:**
    - Adjusting point.
    - The  $\nabla$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
    - \* marked capacitors and resistors have parts numbers.
- This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

- SWITCHES:**
- S1: POWER ON - STAND BY
  - S3~10: STATION CALL
  - S11: MEMORY
  - S12: DOWN TUNING
  - S13: UP TUNING
  - S15: AM
  - S16: FM
- The underlined indicates the switch position.

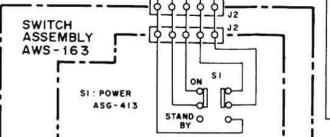
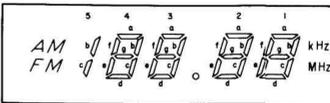
## Power Supply Circuit for TX-950/YP



- |                   |                          |              |                   |
|-------------------|--------------------------|--------------|-------------------|
| FU601 AEK-407     | L104,105,201,202 ATH-049 | T401 ATB-099 | TC401,402 ACM-015 |
| *R720,721 ACN-142 | L401 ATB-100             | F201 ATF-119 |                   |
| VR301 VRT86VS332  |                          | F202 ATF-107 |                   |
| C713 ACH-243      |                          | F301 ATF-146 |                   |
| L101 ATC-192      | T101 ATC-194             | F401 ATF-133 |                   |
| L102 ATC-193      | T102 ATE-063             | X701 ASS-025 |                   |
| L103 ATC-214      | T201 ATE-052             | V1 AAV-017   |                   |

- |                 |   |
|-----------------|---|
| D101~103 15V147 | D201,202,301,403,404, D701~709 D801,802 |
| 151555          | D302,801~604,606 55566                  |
| D401,402        | SVC3 21C2/D2                            |
| D605 RD5.6EB    |   |

- |                 |   |
|-----------------|---|
| IC201 PA3001-A  | Q101 25K241-Y                               |
| IC301 HA12016   | Q102 25C2786-L                              |
| IC401 LA1247    | Q103,201 25C2668                            |
| IC601 NJM79M13A | Q104,105 25K161-Y                           |
| IC701 TD6104P   | Q301~303, 606,608, Q701,702,704,705 25C2458 |
| IC702 TC9157P   | Q304, 605,607,703 25A1048                   |
| IC703 TD6301AP  | Q706,707,801,802 25C2458                    |



## 2. FOR S AND S/G TYPES

### NOTES:

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

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

560Ω	56 × 10 <sup>1</sup>	561 . . . . .	RD½PS	561 J
47kΩ	47 × 10 <sup>3</sup>	473 . . . . .	RD½PS	473 J
0.5Ω	0R5 . . . . .		RN2H	0R5 K
1Ω	010 . . . . .		RS1P	010 K

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

5.62kΩ	562 × 10 <sup>1</sup>	5621 . . . . .	RN½SR	5621 F
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- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.  
**★★ GENERALLY MOVES FASTER THAN ★**  
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

The S and S/G types are the same as the KU type with the exception of the following sections.

### Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.			Remarks
		KU type	S type	S/G type	
 <b>★★</b>	FU601 Complex assembly Fuse (0.8A/125V) Operating Instructions (Spanish) Packing case	GWM-346	GWM-357	GWM-357	
		AEK-118	...	...	
		...	ARC-068	...	
		AHE-332	AHE-354	AHE-354	
	AC power cord	ADG-073	ADG-072	ADG-072	

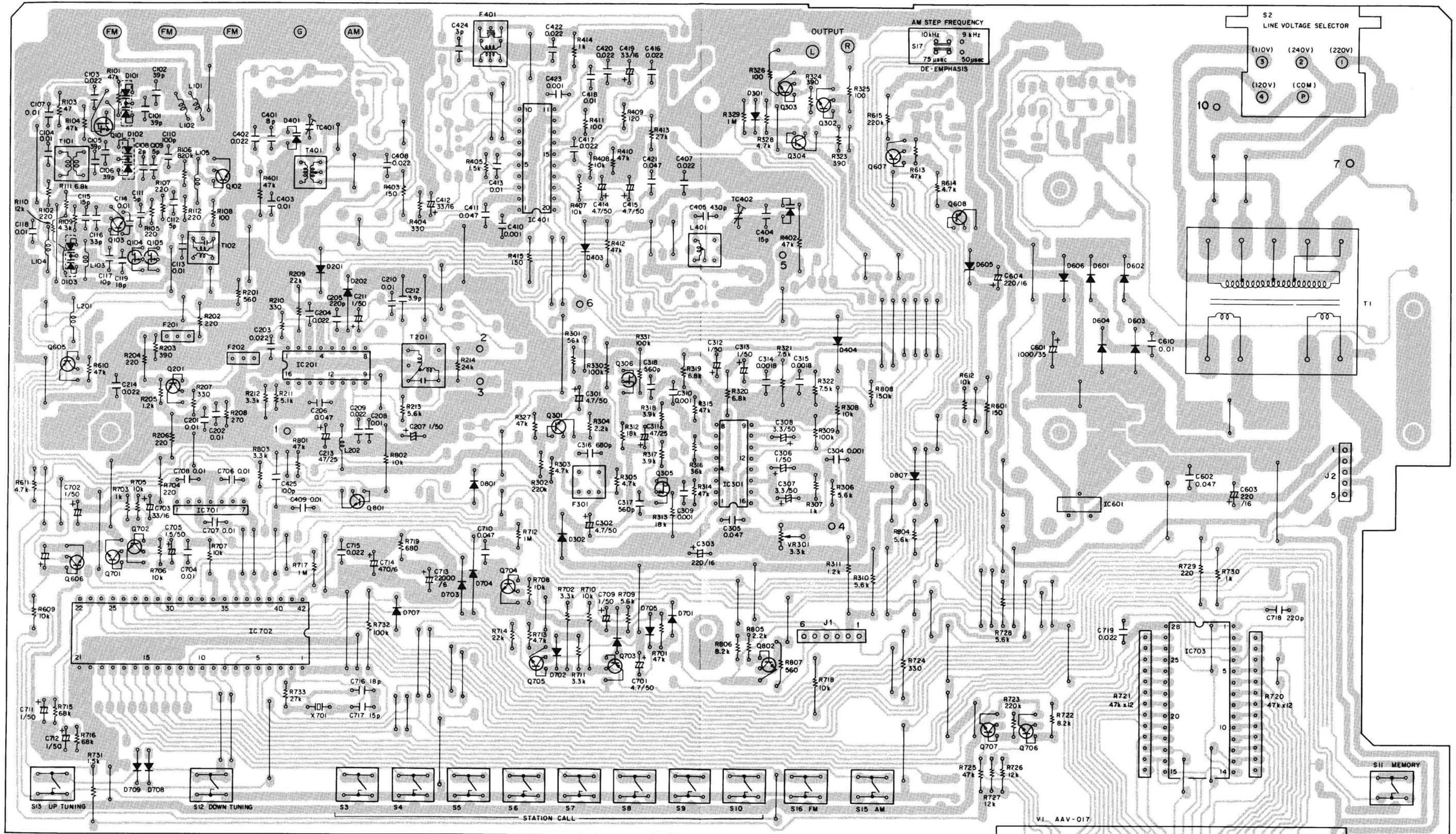
### Complex Assembly (GWM-357)

The complex assembly GWM-357 (for S and S/G types) is the same as the GWM-346 (for the KU type) with the exception of the following sections.

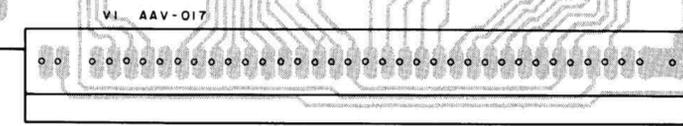
Mark	Symbol & Description	Part No.		Remarks
		GWM-346	GWM-357	
 <b>★</b>	R616 Carbon composition	ACN-140	...	
	T1 Power transformer	ATS-095	ATS-097	
	 <b>★★</b>	S2 Line voltage selector	...	

# COMPLEX ASSEMBLY (GWM-357)

Q101 Q103 Q104 Q105 Q201 Q102  
 Q605 Q606 Q701 Q702 IC701 IC702 IC201 Q801 IC401 Q301 Q306 Q305 IC301 Q303 Q302 Q802 Q304 Q607 Q608 Q707 Q706 IC601 IC703  
 VR301

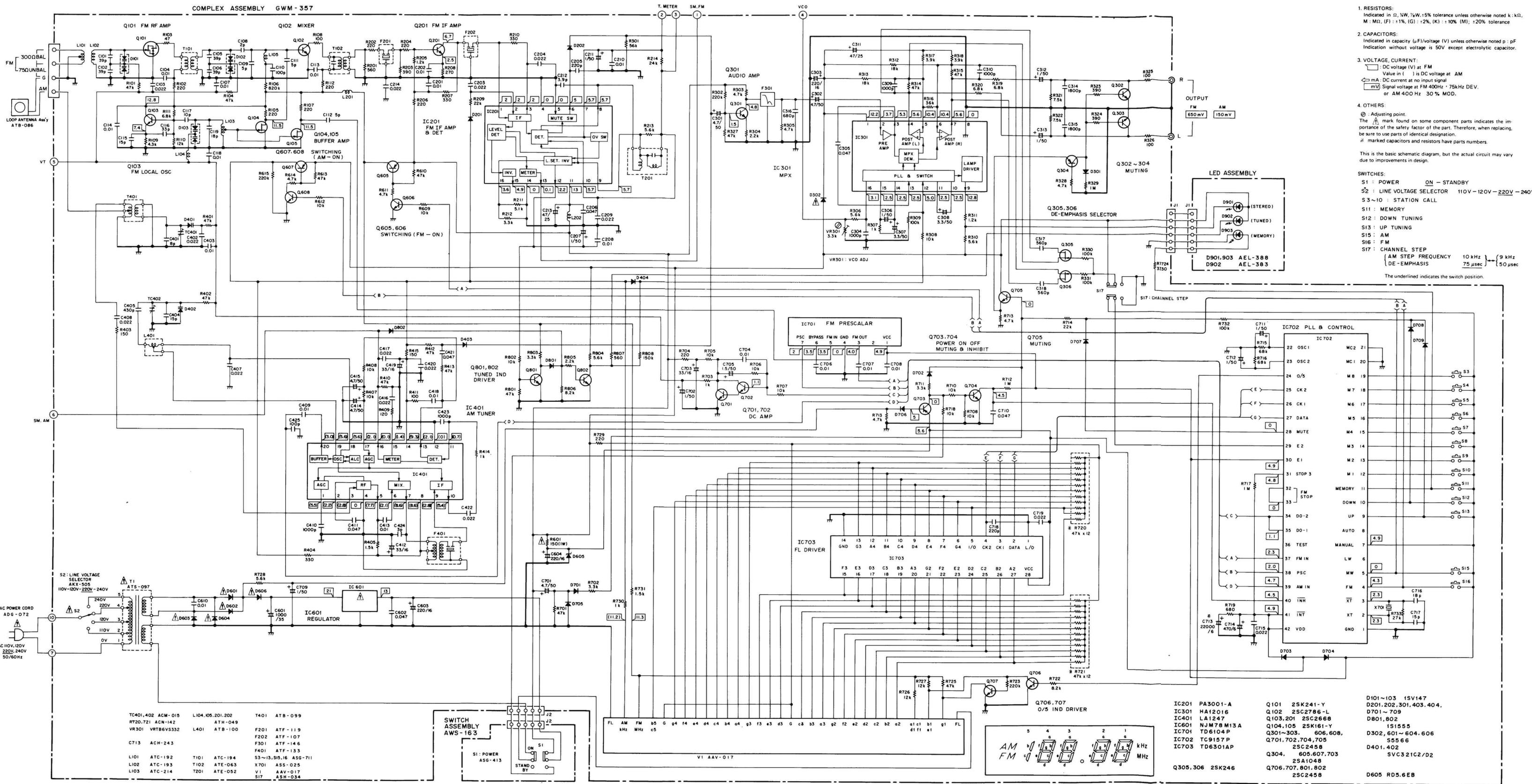


IC201	PA3001-A	Q101	2SK241-Y	Q304, 605, 607, 703	D101~103	1SV147	D401, 402	SVC321C2
IC301	HA12016	Q102	2SC2786-L		D201, 202, 301, 403, 404,		D605	RD5.6EB
IC401	LA1247	Q103, 201	2SC2668	Q305, 306	D701~709, 801, 802			
IC601	NJM78M13A	Q104, 105	2SK161-Y					
IC701	TD6104P	Q301~303, 606, 608,		Q706, 707, 801, 802				
IC702	TC9157P	Q701, 702, 704, 705						
IC703	TD6301AP		2SC2458		D302, 601~604, 606			
								S5566



# SCHEMATIC DIAGRAM (FOR S AND S/G TYPES)

COMPLEX ASSEMBLY GWM - 357



- RESISTORS:**  
Indicated in Ω,  $\frac{1}{4}W$ ,  $\frac{1}{2}W$ ; ±5% tolerance unless otherwise noted k: k $\Omega$ , M: M $\Omega$ , (F): ±1%, (G): ±2%, (K): ±10% (M): ±20% tolerance
- CAPACITORS:**  
Indicated in capacity ( $\mu F$ )/voltage (V) unless otherwise noted p: pF  
Indication without voltage is 50V except electrolytic capacitor.
- VOLTAGE, CURRENT:**  
⊖: DC voltage (V) at FM  
Value in ( ) is DC voltage at AM  
⊖ mA: DC current at no input signal  
⊖ V: Signal voltage at FM 400Hz ±75kHz DEV.  
or AM 400 Hz 30% MOD.

- OTHERS:**  
⊖: Adjusting point.  
The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
⊖: marked capacitors and resistors have parts numbers.

- This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.
- SWITCHES:**  
S1: POWER ON - STANDBY  
S2: LINE VOLTAGE SELECTOR 110V - 120V - 220V - 240V  
S3 ~ S10: STATION CALL  
S11: MEMORY  
S12: DOWN TUNING  
S13: UP TUNING  
S15: AM  
S16: FM  
S17: CHANNEL STEP  
{ AM STEP FREQUENCY 10 kHz } → { 9 kHz }  
{ DE-EMPHASIS 75  $\mu$ sec } → { 50  $\mu$ sec }
- The underlined indicates the switch position.

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

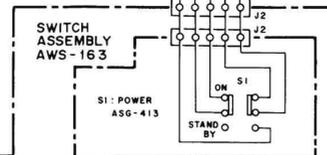
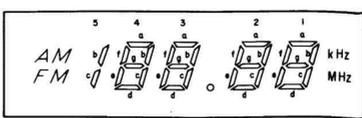
TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

TC401, 402	ACM-015	L104, 105, 201, 202	ATH-049	T401	ATB-099
VR201	VRT86V3332	L401	ATB-100	F201	ATF-119
				F202	ATF-107
				F301	ATF-146
				F401	ATF-133
				S3 ~ S13, S15, 16	ASG-711
				X701	ASS-025
				V1	AAV-017
				S17	ASH-034

IC201	PA3001-A	Q101	2SK241-Y	D101~103	1SV147
IC301	HA12016	Q102	2SC2786-L	D201, 202, 301, 403, 404,	
IC401	LA1247	Q103, 201	2SC2668	D701 ~ 709	
IC601	NJM78M13A	Q104, 105	2SK161-Y	D801, 802	
IC701	TD6104P	Q301~303,	606, 608,	D302, 601 ~ 604, 606	
IC702	TC9157P	Q701, 702, 704, 705	2SC2458	D401, 402	
IC703	TD6301AP	Q304,	605, 607, 703	SV C 21C2/D2	
		Q706, 707, 801, 802	2S A104B		
			2SC2458		
Q305, 306	2SK246			D605	RD5.6EB



V1 AAV-017

Q706, 707 0/5 IND DRIVER

IC201	PA3001-A	Q101	2SK241-Y	D101~103	1SV147
IC301	HA12016	Q102	2SC2786-L	D201, 202, 301, 403, 404,	
IC401	LA1247	Q103, 201	2SC2668	D701 ~ 709	
IC601	NJM78M13A	Q104, 105	2SK161-Y	D801, 802	
IC701	TD6104P	Q301~303,	606, 608,	D302, 601 ~ 604, 606	
IC702	TC9157P	Q701, 702, 704, 705	2SC2458	D401, 402	
IC703	TD6301AP	Q304,	605, 607, 703	SV C 21C2/D2	
		Q706, 707, 801, 802	2S A104B		
			2SC2458		
Q305, 306	2SK246			D605	RD5.6EB

### 3. FOR SS TYPE

**NOTES:**

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

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

560Ω	56 × 10 <sup>1</sup>	561 . . . . .	RD½PS	561 J
47kΩ	47 × 10 <sup>3</sup>	473 . . . . .	RD½PS	473 J
0.5Ω	0R5 . . . . .		RN2H	05 K
1Ω	010 . . . . .		RS1P	010 K

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

5.62kΩ	562 × 10 <sup>1</sup>	5621 . . . . .	RN¼SR	5621 F
--------	-----------------------	----------------	-------	--------

- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**  
**★★** *GENERALLY MOVES FASTER THAN ★*  
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

The SS type is the same as the KU type with the exception of the following sections.

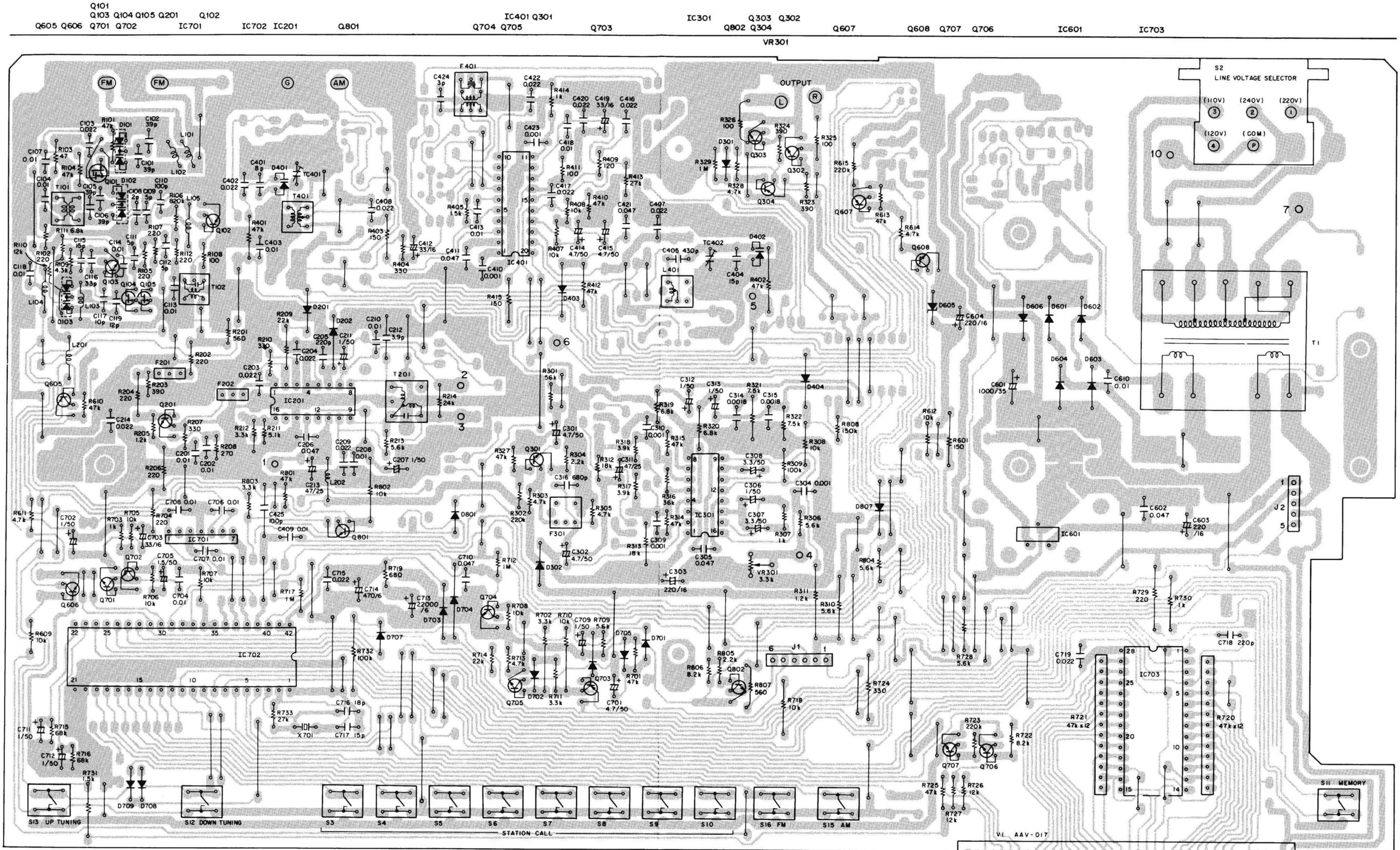
**Contrast of Miscellaneous Parts**

Mark	Symbol & Description	Part No.		Remarks
		KU type	SS type	
 <b>★★</b>	FU601 Complex assembly Fuse (0.8A/125V)	GWM-346	GWM-364	
	Packing case	AEK-118	...	
	AC power cord	AHE-332	AHE-354	
		ADG-073	ADG-072	

The complex assembly GWM-364 (for SS type) is the same as the GWM-346 (for KU type) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		GWM-346	GWM-364	
<b>★★</b>	Q305, Q306	2SK246	...	
 <b>★</b>	T1 Power transformer	ATS-095	ATS-097	
	L103 FM OSC coil	ATC-214	ATC-215	
 <b>★★</b>	S2 Line voltage selector	...	AKX-505	
<b>★★</b>	S17 Slide switch	ASH-034	...	
	C119	CCDTH 180J 50	CCD TH 120J 50	
	C317, C318	CKDYB 561K 50	...	
	R616 Carbon composition	ACN-140	...	
	R330, R331	RD1/8PM □□□J	...	

# COMPLEX ASSEMBLY (GWM-364)



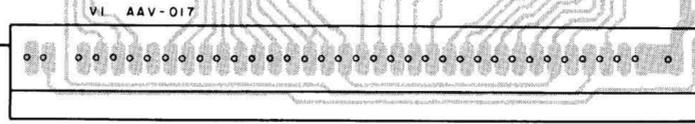
IC201 PA3001-A  
 IC301 HA12016  
 IC401 LA1247  
 IC601 NJM78M13A  
 IC701 TD6104P  
 IC702 TC9157P  
 IC703 TD6301AP

Q101 2SK241-Y  
 Q102 2SC2786-L  
 Q103,201 2SC2668  
 Q104,105 2SK161-Y  
 Q301~303,606,608,  
 Q701, 702, 704,705  
 2SC2458

Q304,605,607,703  
 2SA1048  
 Q706,707,801,802  
 2SC2458

D101~103 1SV147  
 D201,202,301,403,404,  
 D701~709,801,802  
 1S1555  
 D302,601~604,606  
 S5566

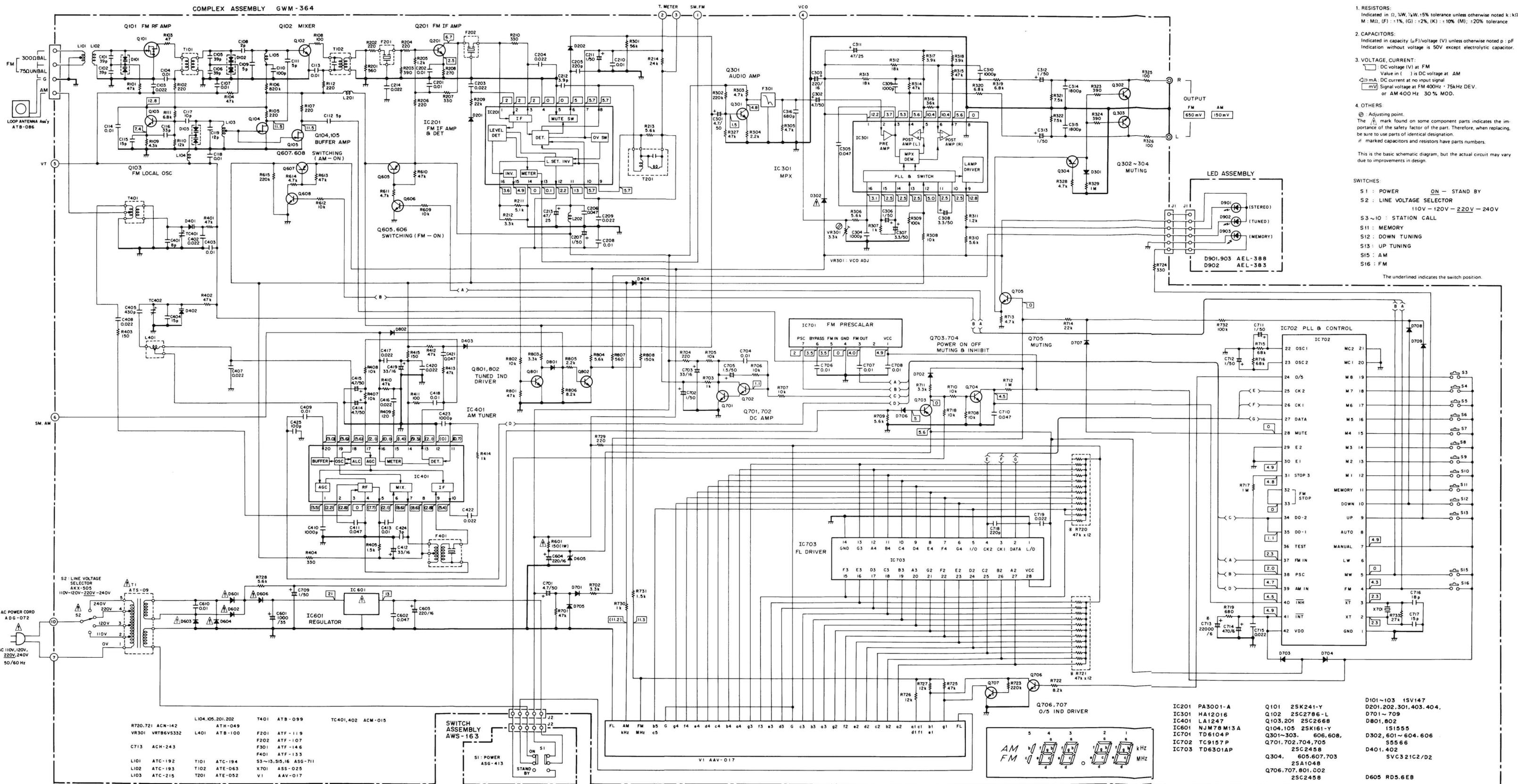
D401,402 SVC321C2/D2  
 D605 RD5.6EB



VI AAV-017

# SCHEMATIC DIAGRAM (FOR SS TYPE)

COMPLEX ASSEMBLY GWM-364



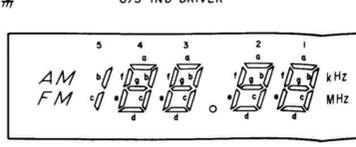
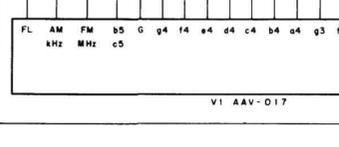
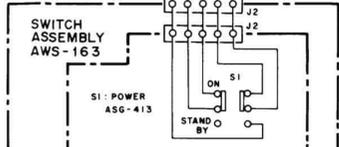
- RESISTORS:**  
Indicated in Ω, kΩ, MΩ, 1% tolerance unless otherwise noted k: kΩ, M: MΩ, (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% tolerance
- CAPACITORS:**  
Indicated in capacity (μF)/voltage (V) unless otherwise noted p: pF  
Indication without voltage is 50V except electrolytic capacitor.
- VOLTAGE, CURRENT:**  
□ DC voltage (V) at FM  
Value in ( ) is DC voltage at AM  
◁ mA DC current at no input signal  
mV Signal voltage at FM 400Hz ± 75kHz DEV. or AM 400 Hz 30% MOD.

**4. OTHERS**  
⊗ Adjusting point.  
The ⊗ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
⊗ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

- SWITCHES:**
- S1: POWER ON - STAND BY
  - S2: LINE VOLTAGE SELECTOR  
110V - 120V - 220V - 240V
  - S3 ~ 10: STATION CALL
  - S11: MEMORY
  - S12: DOWN TUNING
  - S13: UP TUNING
  - S15: AM
  - S16: FM
- The underlined indicates the switch position.

R720, 721 ACN-142	L104, 105, 201, 202	T401 ATB-099	TC401, 402 ACM-015
VR301 VRT86V5332	L401 ATB-100	F201 ATF-119	
		F202 ATF-107	
		F301 ATF-146	
		F401 ATF-133	
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	T102 ATC-063	X701 ASS-025	
	T201 ATE-052	V1 AAV-017	



IC201 PA3001-A	Q101 2SK241-Y	D101 ~ 103 1SV147
IC301 HA12016	Q102 2SC2786-L	D201, 202, 301, 403, 404,
IC401 LA1247	Q103, 201 2SC2668	D701 ~ 709
IC601 NJM78M13A	Q104, 105 2SK161-Y	D801, 802
IC701 TD6104P	Q301 ~ 303, 606, 608,	IS1555
IC702 TC9157P	Q701, 702, 704, 705	S5566
IC703 TD6301AP	2SC2458	D302, 601 ~ 604, 606
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	2SC2458	