

ADDITIONAL

 PIONEER®

# Service Manual

ORDER NO.  
ARP-120-0

FM/AM DIGITAL SYNTHESIZED TUNER

# TX-930

HE, HEZ

This additional service manual is applicable to the HE type (European continent model) and HEZ type (West Germany model). Please refer to the KU type (U.S.A. model) service manual (ARP-119) with the exception of this service manual.

## SPECIFICATIONS

The specifications for HE and HEZ types are the same as the KU type except for following sections:

### FM Tuner Section

Sensitivity (DIN) .....	Mono; 1 $\mu$ V
	Stereo; 38 $\mu$ V
Signal-to-Noise Ratio (DIN) .....	Mono; 72dB
	Stereo; 62dB

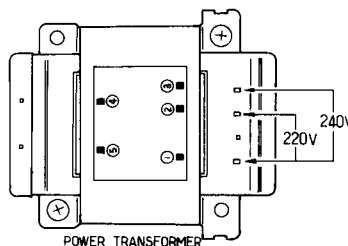
### Miscellaneous

Power Requirements .....	AC220V, 50Hz
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### Line Voltage Selection

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the connection of the power transformer primary taps.
4. Stick the line voltage label on the rear panel.



Part No.	Description
AAX-193	220V label
AAX-192	240V label

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# PARTS LIST

**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 x 10<sup>1</sup>    561 ..... RD¼PS 561J
      - 47kΩ    47 x 10<sup>3</sup>    473 ..... RD¼PS 473J
      - 0.5Ω    0R5 ..... RN2H 0R5K
      - 1Ω      010 ..... RS1P 010K
    - Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
      - 5.62kΩ    562 x 100    5621 ..... RN¼SR 5621F
  - 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.

## Contrast of Miscellaneous Parts

### ELECTRICAL PARTS

Mark	Symbol & Description	Part No.			Remarks
		KU type	HE type	HEZ type	
△ ★	T101 Power transformer (120V)	ATT-916	.....	.....	
△ ★	T101 Power transformer (220/240V)	.....	ATT-906	ATT-906	
△	R1 Carbon composition resistor 2.2M/½W	ACN-029	.....	.....	
	Lithium battery	AEX-008	AEX-008	AEX-008	
	(Ni-Cd alkaline storage battery)*	(AEX-011)*	.....	.....	
△	AC power cord	ADG-052	ADG-062	ADG-062	
	Tuner assembly	AWM-439	AWM-405	AWM-405	
	Complex assembly	AWM-433	AWM-406	AWM-406	

\* Either of batteries (Ni-Cd or Lithium) is used to the memory backup in the KU type.

### EXTERIOR COMPONENT

Mark	Symbol & Description	Part No.			Remarks
		KU type	HE type	HEZ type	
	Top cover	ANE-393	ANE-386	ANE-393	

### PACKING AND FURNISHED PARTS

Mark	Symbol & Description	Part No.			Remarks
		KU type	HE type	HEZ type	
	Packing case	AHE-052	AHE-041	AHE-041	
	Front pad	AHA-296	AHA-296	AHA-296	
	Rear pad	AHA-297	AHA-297	AHA-297	
	Operating instructions (English)	ARB-493	.....	.....	
	Operating instructions (German)	.....	.....	ARC-025	
	Operating instructions (English/German/French/Italian)	.....	ARE-037	.....	
	Station card set	AAN-047	AAN-042	AAN-042	
	Loop antenna holder	AEA-054	AEA-054	AEA-054	
	AM loop antenna	ATB-076	ATB-076	ATB-076	
	T-type FM antenna	ADH-005	ADH-005	ADH-005	
	Connection cord	ADE-051	ADE-051	ADE-051	

### Tuner Assembly (AWM-405)

The tuner assembly AWM-405 is the same as the AWM-439 (for KU type) with the exception of the antenna terminal.

AWM-439 (KU type)	AWM-405 (HE type)	Description
AKA-017	AKA-018	Terminal (ANTENNA)

### Complex Assembly (AWM-406)

The complex assembly (AWM-406) is composed of Control assembly, Switch assembly and Battery assembly.

When replacing the control assembly in the HE and HEZ types, remove the diodes D25, D26, D27 on the new assembly

### Control Assembly

#### CAPACITORS

Mark	Part No.	Symbol & Description
	ACH-363	C25, C26 Electrolytic 3300/16V
	CEA 221M 35L	C31
	CEA 221M 25L	C27
	CEJA 4R7M 35	C35
	CEA 221M 10L	C2, C5
	CEA 101M 35L	C23
	CEA 101M 25L	C22
	CEA 101M 16L	C29
	CEA 220M 50L	C20, C21
	CEA 100M 50L	C17
	CEA 6R8M 50L	C28
	CEA 1R5M 50L	C14
	CEA R68M 50L	C1, C33
	CEA R22M 50L	C15
	CEA 010M 50L	C6, C30, C34
	CCDCH 220J 50	C11, C12
	CKDYB 331K 50	C4
	CKDYB 102K 50	C3
	CKDYB 152K 50	C7
	CKDYF 103Z 50	C9, C10, C13, C18, C19, C24
	CKDYF 473Z 50	C8, C16, C32

#### RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
△	RFA¼PL □□□ J	R80, R82
	RS1LF □□□ J	R96, R403
	RD¼PM □□□ J	R28, R39, R72
	RD1/8PM □□□ J	R1-R27, R29-R38, R40-R71, R73-R79, R81, R83-R95, R97, R98, R401, R402, R404

### SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TC4049BP	Q2
★★	TC4069UBP	Q4
★★	PD6004A (PD6004)	Q6
★★	M54922P	Q8
★★	IR2E01	Q13
★★	M74LS42P	Q14
★★	TD6301P	Q18
★★	2SC2458 (2SC945A) (2SC2603/A/)	Q1, Q5, Q9-Q12, Q15, Q16, Q22, Q26, Q27
★★	2SA1048 (2SA733A) (2SA1115/A/)	Q3, Q7, Q17, Q23-Q25
★★	2SD880 (2SD313)	Q19-Q21
△	★ 10E2FD	D51, D52
	★ 1S2471	D54
	★ 2-1K261	D12-D22
★	1S1555 (1S2076)	D1-D7, D9-D11, D23, D25- D28, D44, D45, D49, D50, D55, D58, D59
★	WZ-320 (MZ-320)	D48
★	WZ-157 (MZ-157)	D47
★	WZ-100 (MZ-100)	D56
★	WZ-061 (MZ-061)	D46
★	SZ-027	D61
★	WZ-046 (MZ-046)	D8, D53
★	AEL-395	D42 LED numeric display
★	AEL-371	D30-D32 LED (Green, SIGNAL)
★	AEL-372	D29, D33-D39, D57 LED (Red, STEREO, STATION)
★	AEL-383	D40, D41, D60 LED (Green, FM, AM, AUTO SCAN)

#### OTHERS

Mark	Part No.	Symbol & Description
★	ASS-020	X1 Ceramic resonator
★	ASS-018	X2 Crystal resonator
★★	ASG-703	S1-S14 Tact switch
	ATH-049	L1 RF choke coil
	ATH-037	L2 Inductor
	AKH-022	IC socket

#### Switch Assembly

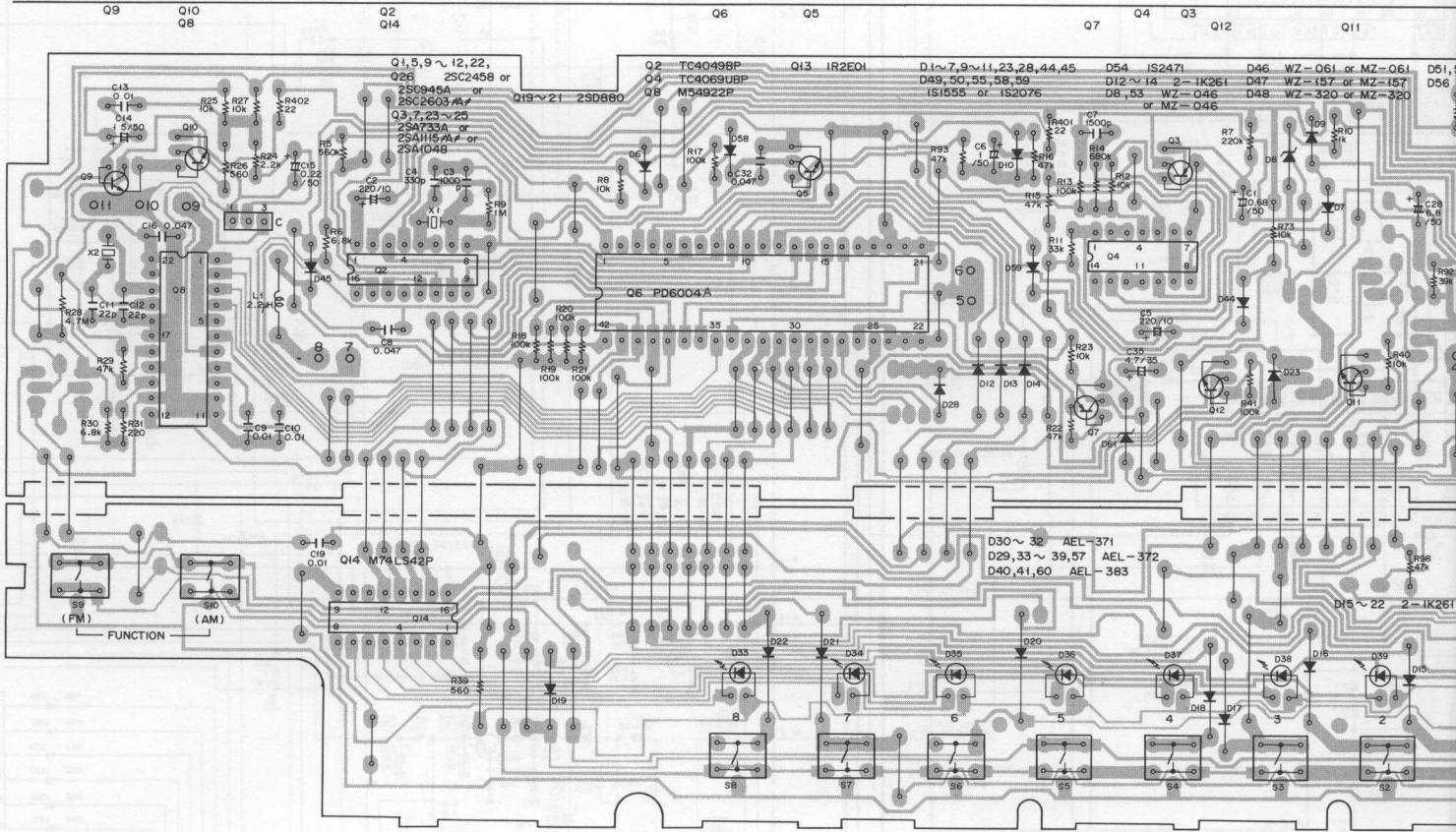
The switch assembly for HE and HEZ types is the same as the KU type.

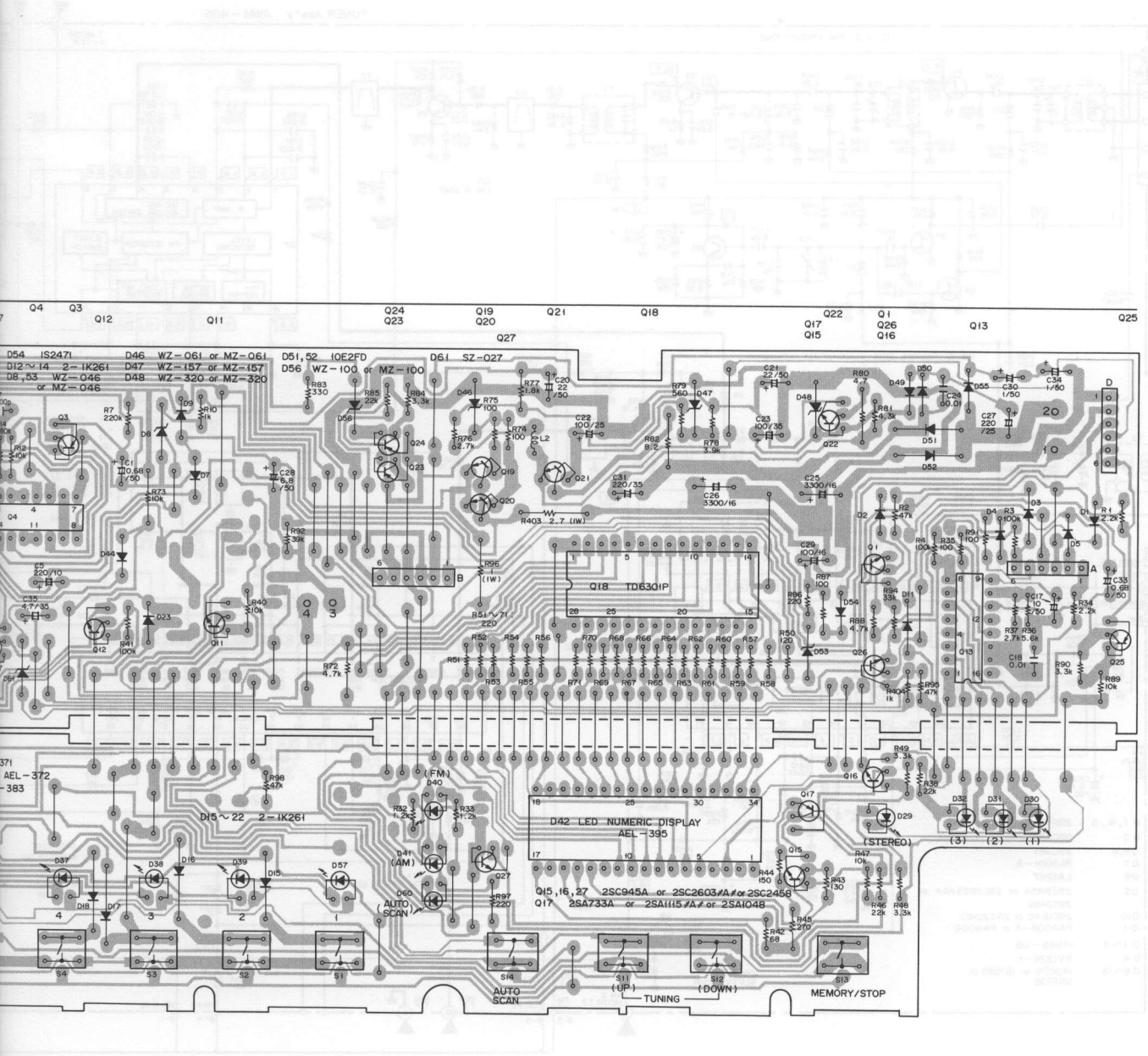
#### Battery Assembly

The battery assembly for HE and HEZ types is the same as the KU type.

# P.C. BOARD PATTERNS

## Control Assembly for HE and HEZ Types





A

B

C

D



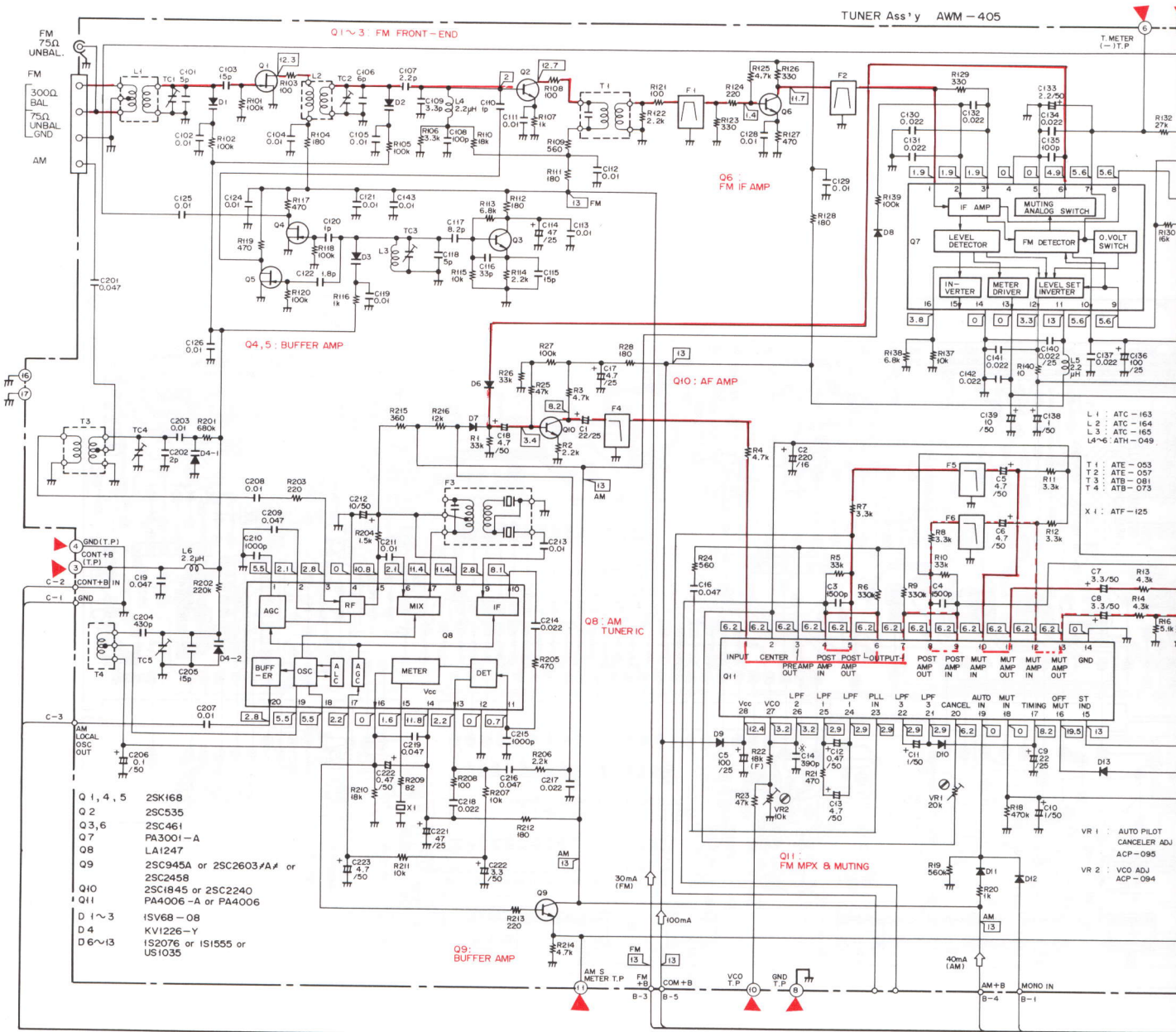
SCHEMATIC DIAGRAM

A

B

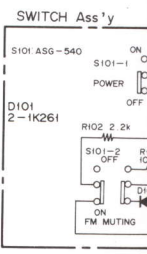
C

D

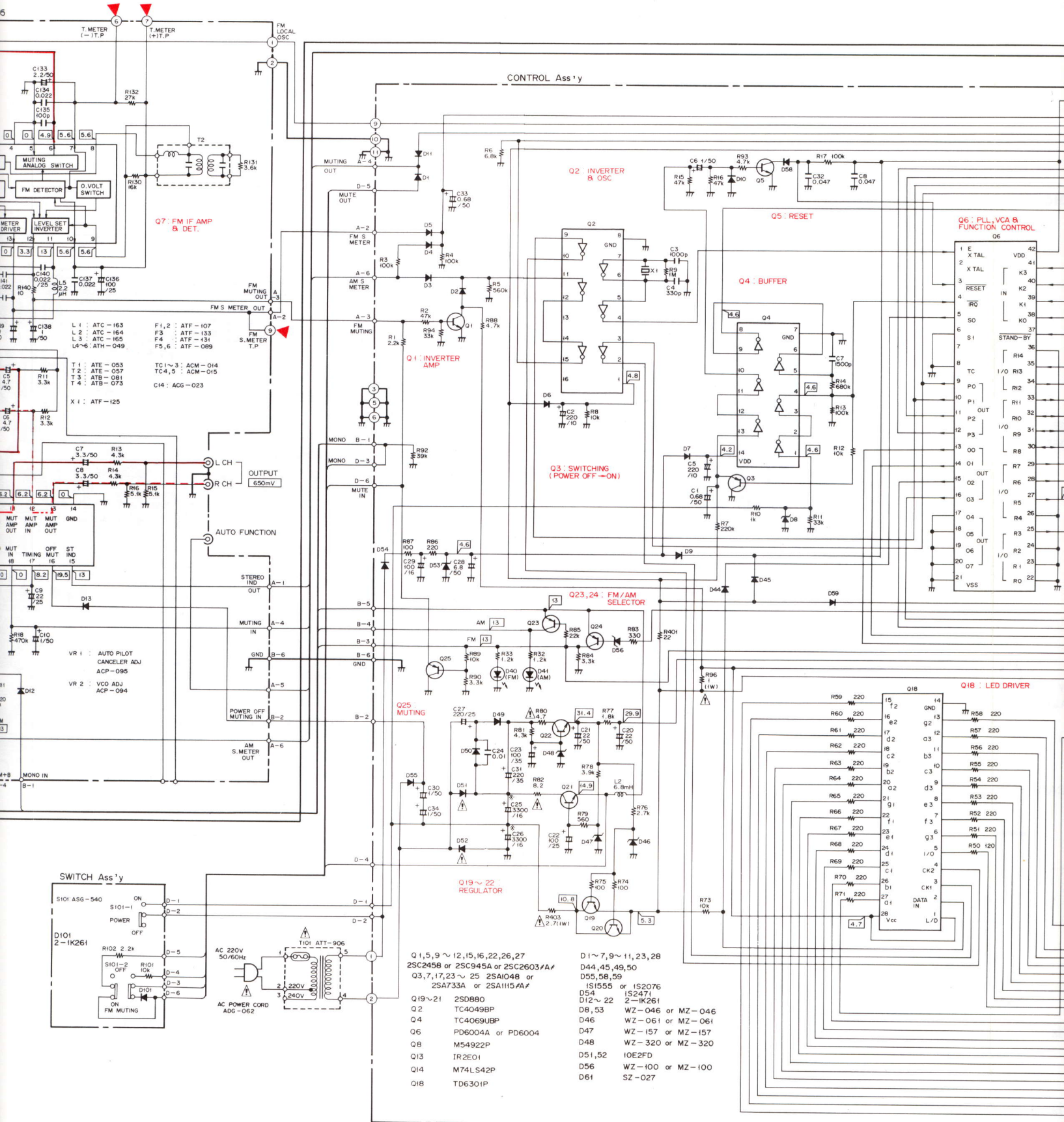


1. RESISTORS.  
Indicated in  $\Omega$ ,  $\frac{1}{4}W$ ,  $\frac{1}{2}W$ ,  $\pm 5\%$  tolerance unless otherwise noted k; k $\Omega$ , M; M $\Omega$ ; (F);  $\pm 1\%$ ; (G);  $\pm 2\%$ ; (K);  $\pm 10\%$ ; (M);  $\pm 20\%$  tolerance
2. CAPACITORS:  
Indicated in capacity ( $\mu F$ )/voltage (V) unless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

5. SWITCHES
- |                        |                    |
|------------------------|--------------------|
| S 1 : STATION CALL (1) | ON - OFF           |
| S 2 : STATION CALL (2) | ON - OFF           |
| S 3 : STATION CALL (3) | ON - OFF           |
| S 4 : STATION CALL (4) | ON - OFF           |
| S 5 : STATION CALL (5) | ON - OFF           |
| S 6 : STATION CALL (6) | ON - OFF           |
| S 7 : STATION CALL (7) | ON - OFF           |
| S 8 : STATION CALL (8) | ON - OFF           |
| S 9 : FUNCTION (FM)    | ON - OFF           |
| S 10 : FUNCTION (AM)   | ON - OFF           |
| S 11 : TUNING (UP)     | ON - OFF           |
| S 12 : TUNING (DOWN)   | ON - OFF           |
| S 13 : MEMORY / STOP   | ON - OFF           |
| S 14 : AUTO SCAN       | ON - OFF           |
| S 101 - 1 : POWER      | ON - OFF           |
| S 101 - 2 : FM MUTING  | ON/AUTO - OFF/MONO |



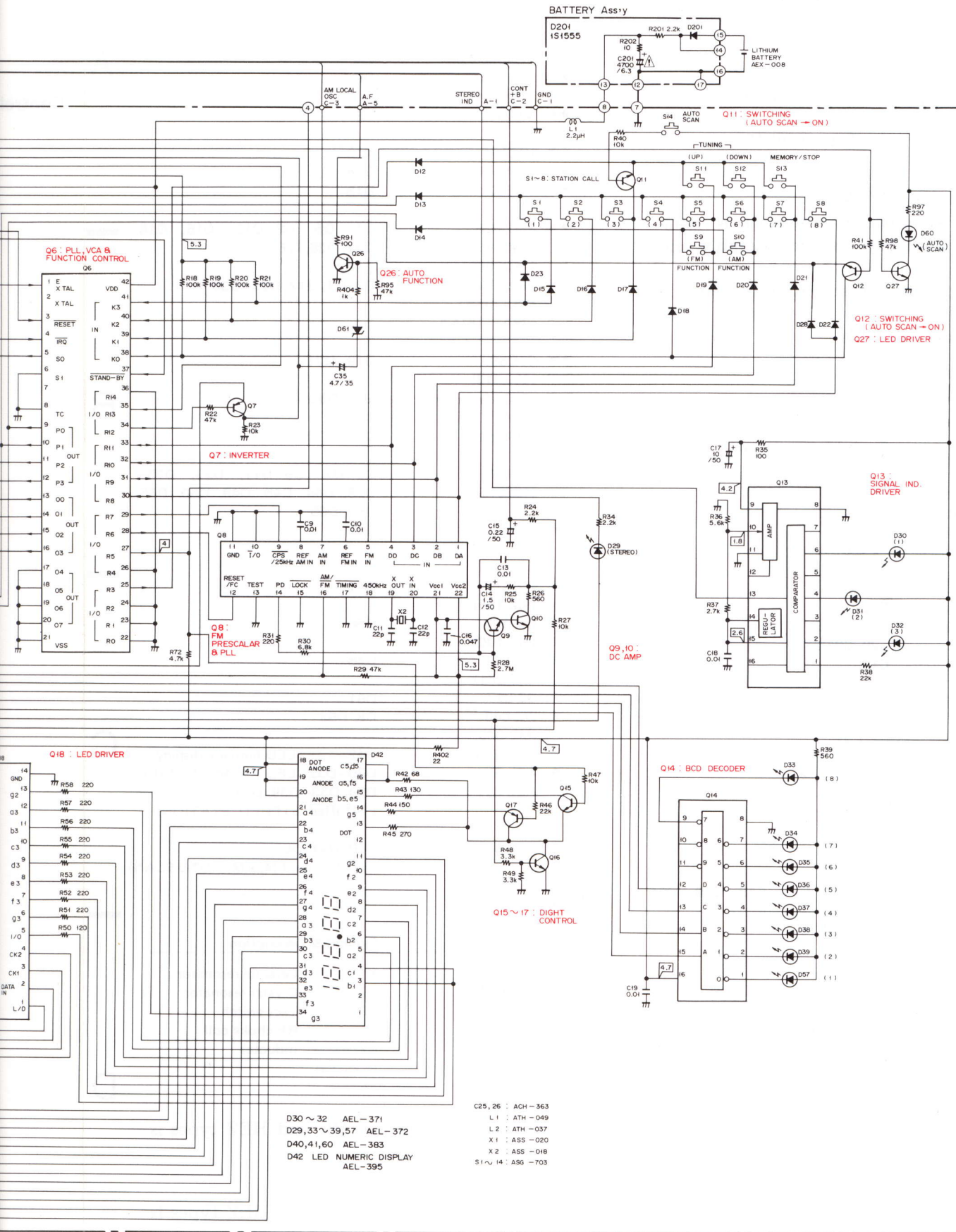
The underlined indicates the switch position.





NOTE:

The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



- D30 ~ 32 AEL-371
- D29, 33 ~ 39, 57 AEL-372
- D40, 41, 60 AEL-383
- D42 LED NUMERIC DISPLAY AEL-395
- C25, 26 : ACH-363
- L1 : ATH-049
- L2 : ATH-037
- X1 : ASS-020
- X2 : ASS-018
- S1 ~ 14 : ASG-703

A

B

C

D