SANGEAN

EUROPE

# Service Manual

# ATS-818 CS

# SPECIFICATIONS

## FM

| TEST ITEM | CONDITION | NOMINAL | LIMIT | UNIT |
|---|---|---|---|---|
| Tuning Range | Min. | 87.5 | ±0.15 | MHz |
| | Max. | 108.0 | ±0.15 | MHz |
| Intermediate Freq. | | 10.7 | ±0.15 | MHz |
| Max. Sens. | 90MHz | | 18 | emf dBμ |
| | 98MHz | | 18 | emf dBμ |
| | 106MHz | | 18 | emf dBμ |
| Useable sens. (S/N 30dB) | 90MHz | 18 | 24 | emf dBμ |
| | 98MHz | 18 | 24 | emf dBμ |
| | 106MHz | 18 | 24 | emf dBμ |
| Calibration | 90MHz | | ±100 | KHz |
| | 98MHz | | ±100 | KHz |
| | 106MHz | | ±100 | KHz |
| Audio Fidelity −3dB 75μs/50μs (W/Pre-emphasis) | 98MHz | | 150 | Hz |
| | 98MHz | | 12K | Hz |
| 3dB Limiting (10mV) | 98MHz | 14 | 20 | emf dBμ |
| Image Rejection | 106MHz | 42 | 36 | dB |
| I. F. Rejection | 90MHz | 60 | 50 | dB |
| Spurious Rejection | 98MHz | | 50 | dB |
| T. H. D. (75KHz. dev.) | 98MHz | 1.5 | 3 | % |
| Lowest Battery Voltage | 98MHz | 3.8 | 4.2 | V |
| Output Power at 10% T. H. D. | 98MHz | 800 | 700 | mW |
| Alter. Channel Select. 100uV | 98MHz | | 25 | dB |
| Stereo Indicator Sens. | 98MHz | | 24 | emf dBμ |
| Tuning Indicator Sens. (2nd.dot) | 98MHz | | 24 | emf dBμ |
| Stereo Separation (1KHz) | 98MHz | 25 | 20 | emf dBμ |
| Auto Scanning Stop Sens. | 98MHz | | 24 | emf dBμ |
| Over Load Capacity | 98MHz | | 100 | emf dBμ |
| Am. Suppression (66 emf dBμ) | 98MHz | | 30 | emf dBμ |
| Min. Output | 98MHz | | 3 | mV |
| Tone Control (10KHz) | 98MHz | 18 | 15 | dB |
| S/N (22.5KHz Dev.) | 98MHz | 58 | 50 | dB |
| Supply Voltage: DC 6V R.O.: 50mW | Load: 4 ohm | Modulation: 1KHz 22.5KHz Dev. | | |

## LW

| TEST ITEM | CONDITION | NOMINAL | LIMIT | UNIT |
|---|---|---|---|---|
| Tuning Range | Min. | 150 | ±5 | KHz |
| | Max. | 519 | ±5 | KHz |
| Intermediate Freq. | 1st. If<br>2nd. If | 55845<br>450 | ±1 | KHz |
| Max. Sens. | 173KHz | | 66 | dBμ/m |
| | 218KHz | | 64 | dBμ/m |
| | 281KHz | | 64 | dBμ/m |
| Useable sens. (S/N 20dB) | 173KHz | 66 | 72 | dBμ/m |
| | 218KHz | 64 | 70 | dBμ/m |
| | 218KHz | 64 | 70 | dBμ/m |
| Calibration | 173KHz | | ±5 | KHz |
| | 218KHz | | ±5 | KHz |
| | 218KHz | | ±5 | KHz |
| Lowest Battery Voltage | 218KHz | 3.8 | 4.2 | V |
| Tuning Indicator Sens. (2nd.dot) | 218KHz | | 68 | emf dBμ |
| Auto Scanning Stop Sens. | 218KHz | | 70 | dBμ/m |
| S/N Ratio (5mV) | 218KHz | | 24 | dB |
| Supply Voltage: DC 6V R.O.: 50mW | Load: 4 ohm | Modulation: 1KHz 30% Mod. | | |

## MW

| TEST ITEM | | CONDITION | NOMINAL | LIMIT | UNIT |
|---|---|---|---|---|---|
| Tuning Range | | Min. | 520 | ±5 | KHz |
| | | Max. | 1620/1710 | ±5 | KHz |
| Intermediate Freq. | | 1st. If<br>2nd. If | 55845<br>450 | ±1 | KHz |
| Max. Sens. | | 600KHz | | 56 | dBμ/m |
| | | 1000KHz | | 54 | dBμ/m |
| | | 1400KHz | | 54 | dBμ/m |
| Useable sens. | | 600KHz | 56 | 62 | dBμ/m |
| | | 1000KHz | 54 | 60 | dBμ/m |
| | | 1400KHz | 54 | 60 | dBμ/m |
| Calibration | | 600KHz | | ±5 | KHz |
| | | 1000KHz | | ±5 | KHz |
| | | 1400KHz | | ±5 | KHz |
| Audio Fidelity (−6dB) | | 1000KHz | | 150 | Hz |
| | | 1000KHz | | 2200 | Hz |
| A. C. A. (±10KHz) | | 1000KHz | | 46 | dB |
| T. H. D. (5mV) | | 1000KHz | 1.5 | 3 | % |
| A.G.C. F.O.M.) | | 1000KHz | | 40 | dB |
| Image Rejection | | 1400KHz | | 36 | dB |
| I. F. Rejection (450KHz) | | 1000KHz | | 46 | dB |
| Whistle Modulation (5mV) | | 2If/3If | | 15 | % |
| Lowest Battery Voltage | | 1000KHz | 3.8 | 4.2 | V |
| Tuning Indicator Sens. (2nd.dot) | | 1000KHz | | 58 | dBμ/m |
| Auto Scanning Stop Sens. | | 1000KHz | | 60 | dBμ/m |
| S/N Ratio (5mV) | | 1000KHz | | 35 | dB |
| Out Put Power at 10% T.H.D. | | 1000KHz | 800 | 700 | mW |
| Bandwidth 6dB (Wide) | | 1000KHz | 6 | 4-8 | KHz |
| Bandwidth 6dB (Narrow) | | 1000KHz | 4.5 | 2.5-7 | KHz |
| Supply Voltage: DC 6V | R.O.: 50mW | Load: 4 ohm | Modulation: 1KHz 30% Mod. | | |

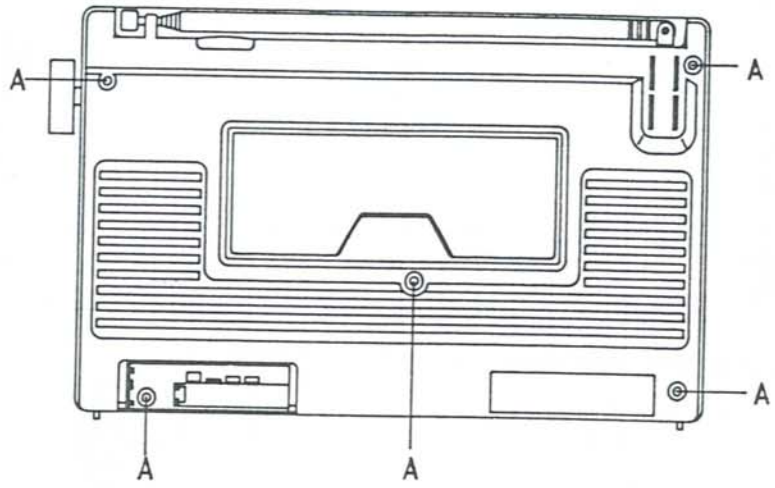
## CASSETTE

| TEST ITEM | CONDITION | NOMINAL | LIMIT | UNIT |
|---|---|---|---|---|
| Tape Speed ±3% 3KHz | MTT-111LN-ST | | ±90 | Hz |
| | MTT-111LN-END | | ±90 | Hz |
| Wow And Flutter (JIS) Rms | MTT-111LN-ST | | 0.35 | % |
| | MTT-111LN-END | | 0.35 | % |
| Play T.H.D. | MTT-112BN | 1 | 3 | % |
| Play S/N Ratio | MTT-112BN | 46 | 40 | dB |
| Play Output Power 10% | MTT-112BN | 900 | 800 | mW |
| Erase Ration W/(1KHz Filter) | MTT-5511 | | 45 | dB |
| | MTT-5561 | | 36 | dB |
| Crosstalk W/(1KHz Filter) | MTT-141N | | 40 | dB |
| Channel Separation W/(1KHz Filter) | MTT-141N | | 40 | dB |
| Play Freq Response (1KHz OdB) | MTT-256 125Hz/10KHz | | ±6 | dB |
| | MTT-356 125Hz/12.5KHz | | ±6 | dB |
| Lowest Battery Voltage | | 3.8 | 4.2 | V |
| REC/Play Freq Responsf AT FM | MTT-5511 125Hz/8KHz | | ±6 | dB |
| 60 emf dBμ 22.5K dev. | MTT-5561 125Hz/10KHz | | ±6 | dB |
| REC Sens AT FM | MTT-5511 1KHz | | +(3-8) | dB |
| 60emf dBμ 22.5 dev | MTT-5511/MTT-118N | | +(3-8) | dB |
| REC Alc AT FM 60emf dBμ dev 22.5/75KHz | MTT-5511 1KHz | −4 | −(2-6) | dB |
| Supply Voltage: 6V R.O.: 50mV | Load: 4 ohm | | | |

## SW

| TEST ITEM | | CONDITION | NOMINAL | LIMIT | UNIT |
|---|---|---|---|---|---|
| Tuning Range | | Min. | 1621/1711 | ±5 | KHz |
| | | Max. | 29999 | ±5 | KHz |
| Intermediate Freq. | | 1st. If<br>2nd. If | 55845<br>450 | ±1 | KHz |
| Max. Sens. | | 2300KHz | | 24 | emf dBμ |
| | | 15100KHz | | 22 | emf dBμ |
| | | 25600KHz | | 22 | emf dBμ |
| Useable sens. (S/N 20dB) | | 2300KHz | 22 | 28 | emf dBμ |
| | | 15100KHz | 22 | 28 | emf dBμ |
| | | 25600KHz | 22 | 28 | emf dBμ |
| Calibration | | 2300KHz | | ±5 | KHz |
| | | 15100KHz | | ±5 | KHz |
| | | 25600KHz | | ±5 | KHz |
| Audio Fidelity (−6dB) | | 15100KHz | | 150 | Hz |
| | | 15100KHz | | 2200 | Hz |
| A. C. A. (±10KHz) | | 15100KHz | | 46 | dBμ |
| SS B/CW Sens S/N: 10dB | | 15100KHz | −3 | 3 | emf dbμ |
| T. H. D. (60 emf dBμ) | | 15100KHz | 1.5 | 3 | % |
| A.G.C. F.O.M. (86 emf dBμ) | | 15100KHz | | 50 | dB |
| Image Rejection | | 15100KHz | | 30 | dBμ |
| I. F. Rejection (450KHz) | | Hz | | 50 | dB |
| Lowest Battery Voltage | | 15100KHz | 3.8 | 4.2 | V |
| Tuning Indicator Sens. (2nd.dot) | | 15100KHz | | 24 | emf dBμ |
| Auto Scanning Stop Sens. | | 15100KHz | | 28 | emf dBμ |
| AM RF Gain VR: Max | | 15100KHz | −25 | ±6 | dB |
| S/N Ratio (60 emf dBμ) | | 15100KHz | | 40 | dB |
| Out Put Power at 10% T.H.D. | | 15100KHz | | 700 | mW |
| Overload Capacity<br>(80% Mod 10% T.H.D) | | 15100KHz | 90 | 84 | emf dBμ |
| Bandwidth 6dB (Wide) | | 15100KHz | 6 | 4-8 | KHz |
| Bandwidth 6dB (Narrow) | | 15100KHz | 4.5 | 3-7 | KHz |
| Supply Voltage: DC 6V | R.O.: 50mW | Load: 4 ohm | Modulation: 1KHz 30%Mod. | | |

# DISASSEMBLY INSTRUCTIONS




## TO REMOVE BACK COVER

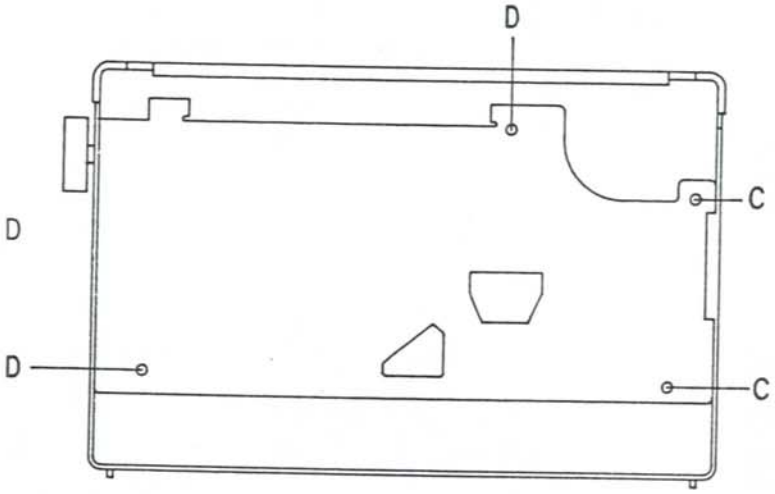
a. Unscrew 5 screw A.

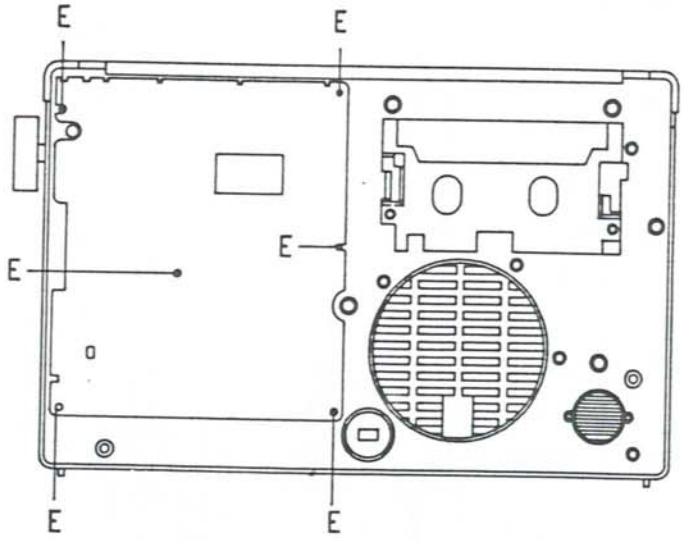
b. Separate front and back cabinet.

## TO REMOVE MAIN PCB

a.Remove 2 screw C.

b.Release Main PCB from 2 scrsw D to remove it.

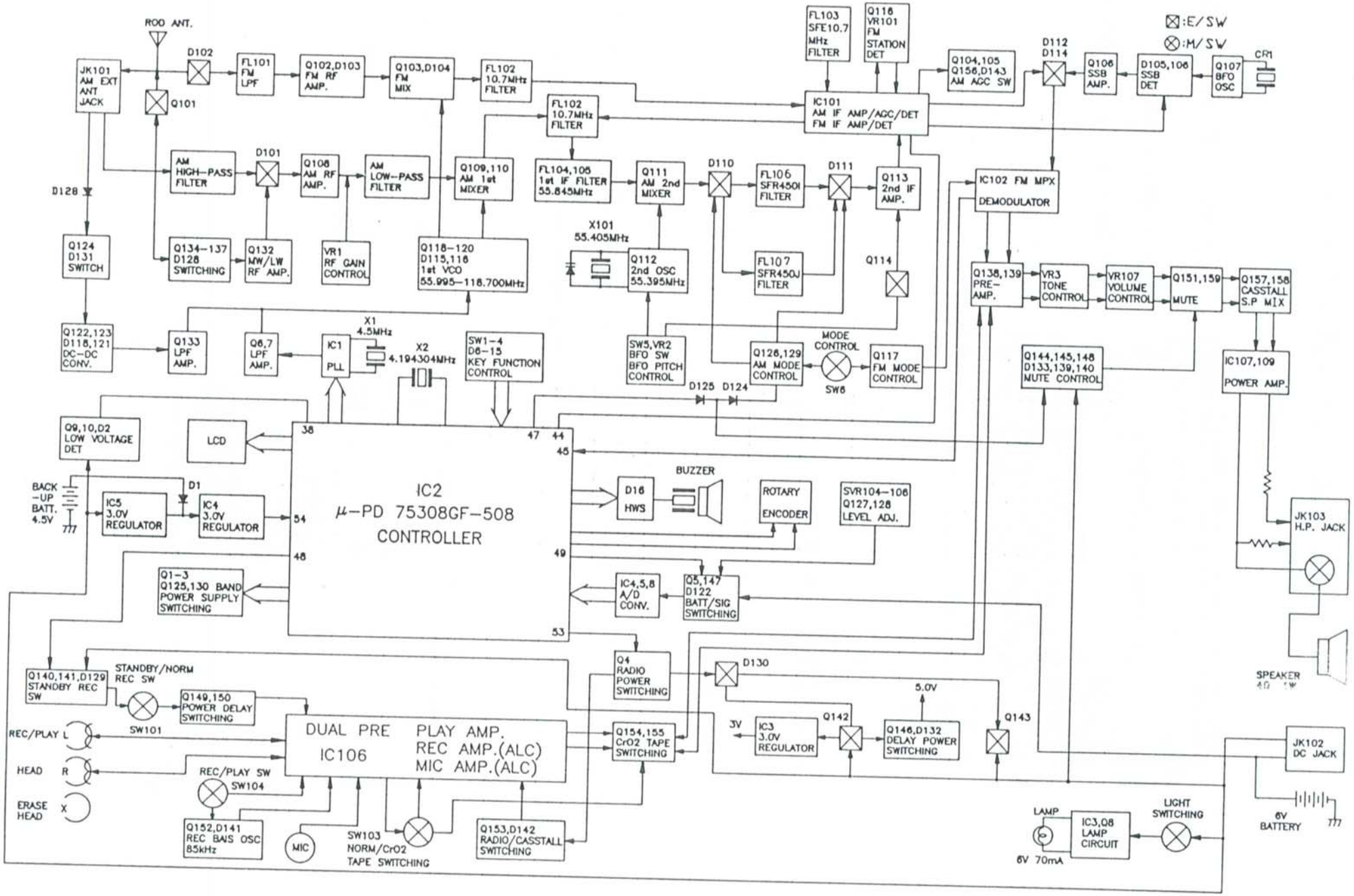



## TO REMOVE CONTROL PCB

a. Release Control PCB from 5 scrsw E to remove it.

# BLOCK DIAGRAM



# ALIGNMENT INSTRUCTIONS

Note : (1) All test points are shown both on schematic diagram and figures 1-15.
(2) Please load in fresh batteries before any alignment procedures.

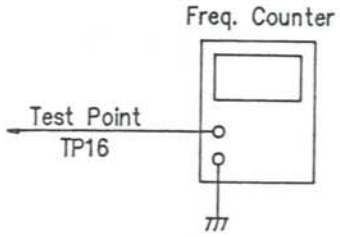
## (1) ALIGNMENT FOR CLOCK TIME ACCURACY

a. Required Instrument
Frequency Counter

b. Alignment Procedure

| Adjustment | Procedure |
|---|---|
| VC2 | (1) Turn the radio to SLEEP ON mode.<br>(2) Set the SAFETY switch upward to electrically lock all push buttons.<br>(3) Remove the batteries from the RADIO BATTERY compartment ,the monitor TIME BASE signal starts functioning.<br>(4) Connect a frequency counter to TP 16 (PIN48 OF IC2) .<br>(5) Adjust VC2 to reach a reading 524288 ± 4Hz ( ± 7.6PPM or ± 20sec/month) on counter. |

c. Instrument Connection



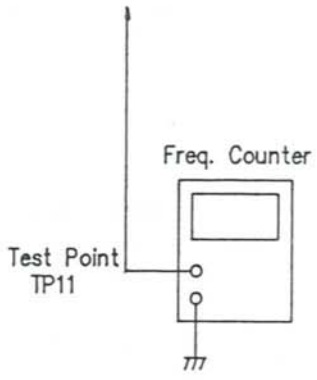

## (2) ALIGNMENT FOR PLL FREQUENCY

a. Required Instrument
Frequency Counter

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| FM | VC1 | (1) Turn the radio ON.<br>(2) Select the tuner frequency at 108 MHz.<br>(3) Connect the test probes of frequency counter to TP11 and ground. The ground point should be as near as possible to the test point TP11.<br>(4) Adjust VC1 to have a reading of 118.69975MHz-118.70025MHz. |

c. Instrument Connection



(3) ALIGNMENT FOR AM 2ND LOCAL OSC

a. Required Instrument

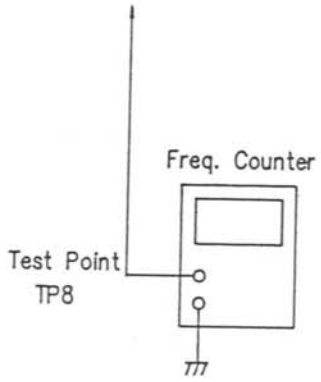
Frequency counter with higher impedance probe.

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| AM | T111 | (1) Turn the radio ON.<br>(2) Tune the frequency far away from any station to avoid interference.<br>(3) Connect the test probes of frequency counter to TP8 and ground.<br>(4) Adjust T111 to have a reading of 55.39485MHz-55.39515MHz. |

Caution : A loading effect could emerge in the circuit if inserted with a lower impedance probe of frequency counter.

c. Instrument Connection




(4) ALIGNMENT FOR AM 2ND IF

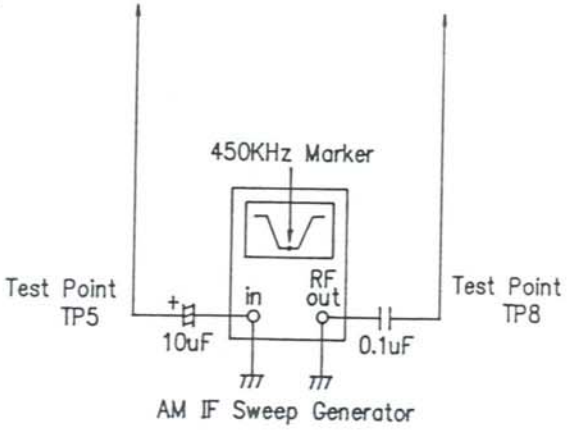
a. Required Instrument

AM IF Sweep Generator with Scope

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| AM | T104<br>T112 | (1) Turn the radio ON.<br>(2) Set the bandwidth switch to WIDE position.<br>(3) Connect the input terminal of AM IF sweep generator in series with a capacitor of 10μF to the test point TP5.<br>(4) Connect the RF output terminal of AM IF sweep generator in series with a capacitor 0.1μF to another test point TP8.<br>(5) Adjust T104 to have a mzx. output with a marker frequency of 450kHz on the sweep scope.<br>(6) Adjust T112 to have a max. output with a marker frequency of 450kHz on the sweep scope.<br>(7) Repeat (5) and (6) until a max. 450kHz output is reached. |

c. Instrument Connection



## (5) ALIGNMENT FOR FM IF

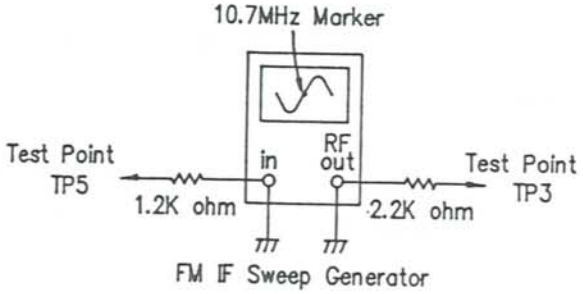
a. Required Instruments

FM IF Sweep Generator with Scope.

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| FM | T103<br>T105 | (1) Turn the radio ON.<br>(2) Connect the input of FM IF sweep generator in series with a resistor of 1.2K ohm to the test point TP5.<br>(3) Connect the RF output of FM IF sweep generator in series with a resistor of 2.2K ohm to another test point TP3.<br>(4) Adjust T103 and T105 to have a max output and best symmetrical S curve with respect to the center marker frequency of 10.7MHz. |

c. Instrument Connection




## (6) ALIGNMENT FOR AM SENSITIVITY

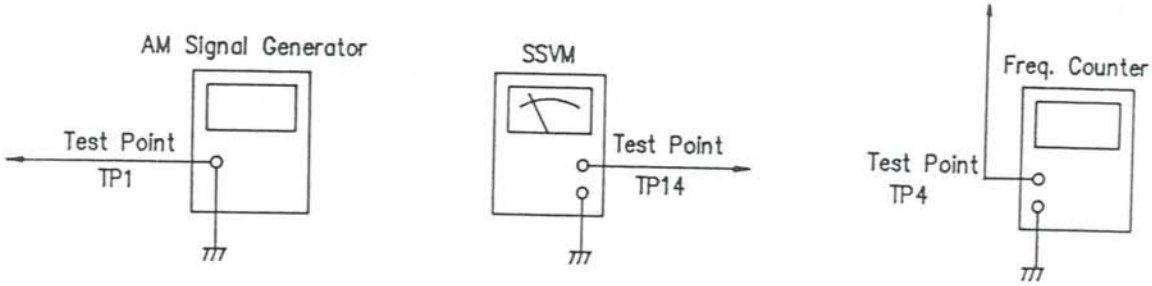
a. Required Instruments

AM Signal Generator
SSVM
Frequency Counter

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| AM | T108<br>T109<br>T110<br>T111 | (1) Turn the radio ON.<br>(2) Set the bandwidth switch to WIDE and RF GAIN VR to MAX position.<br>(3) Tune the radio band frequency to 15.100MHz.<br>(4) Feed a signal with modulation from AM signal generator output to the test point TP1 and connect a SSVM to speaker (TP14).<br>(5) Tune the generator frequency exactly the same as that of the radio frequency displayed.<br>(6) Adjust T108,109,110 to have a max. audio output.<br>(7) Connect the probe of frequency counter at the test point TP4.<br>(8) Adjust T111 to meet the specification frequency 450kHz ± 0.15kHz.<br>(9) Remove the counter and repeat (6) to (8) until the specification frequency is met. |

c. Instrument Connection



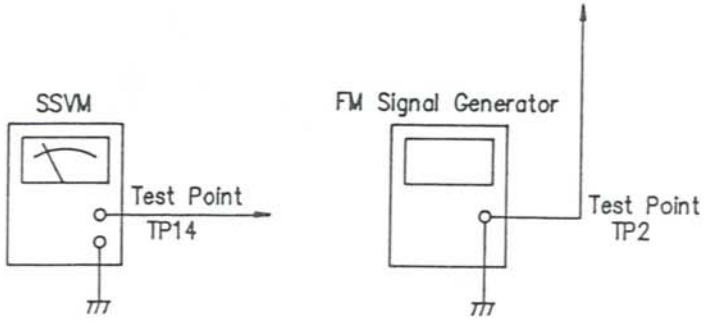
(7) ALIGNMENT FOR FM SENSITIVITY

a. Required Instruments
FM Signal Generator
SSVM

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| FM | T101<br>T102<br>TC101<br>TC102 | (1) Turn the radio ON.<br>(2) Connect a SSVM to speaker (TP14).<br>(3) Connect a FM signal generator to the input terminal of Rod Ant. (TP2).<br>(4) Set the signal generator to 22.5kHz deviation with 1kHz modulation.<br>(5) Tune the radio band frequency to 90MHz and adjust T101,T102 to have a max. reading on SSVM.<br>(6) Return the radio band frequency to 106MHz and adjust TC101,TC102 to have a max. reading on SSVM.<br>(7) Repeat (5) and (6) until a best sensitivity on these two frequencies are formed. |

c. Instrument Connection




(8) ALIGNMENT FOR MPX

a. Required Instrument
Frequency Counter

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| FM | VR102 | (1) Turn the radio ON.<br>(2) Set the FM mode switch to STEREO position.<br>(3) Insert a plug of headphone into the HEADPHONE JACK (J3)<br>(4) Connect the test point TP5 in series with a capacitor of 1μF to ground.<br>(5) Connect a frequency counter to TP6.<br>(6) Adjust VR102 to have a reading of 18.95kHz-19.05kHz on frequency counter. |

c. Instrument Connection

(9) ALIGNMENT FOR INDICATION LEVEL OF BATTERY

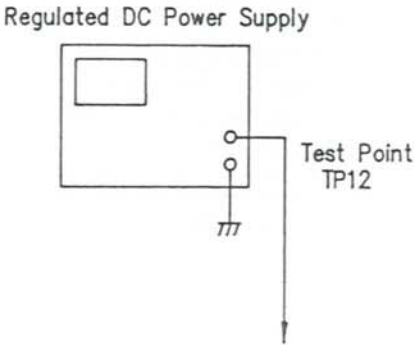
a. Required Instrument

DC Power Supply with voltage meter

b. Alignment Procedure

| Adjustment | Procedure |
|---|---|
| VR105 | (1) Remove batteries away from the RADIO BATTERY compartment.<br>(2) Connect a DC power supply to the test point TP12.<br>(3) Set the voltage to a reading of 4.4V.<br>(4) Turn the radio ON and adjust VR105.<br>(5) Push POWER key again to shut off the radio and the BATTERY LEVEL INDICATOR will immediately appeared on LCD for a period of 5 seconds.<br>(6) Repeat (4) and (5) until the level was indicated on the 2nd. scale. |

c. Instrument Connection




(11) ALIGNMENT FOR 450kHz TRAP

a. Required Instruments

AM Signal Generator

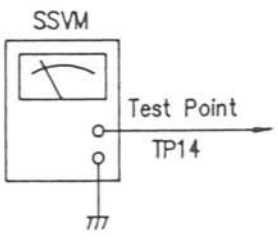
Loop Antenna

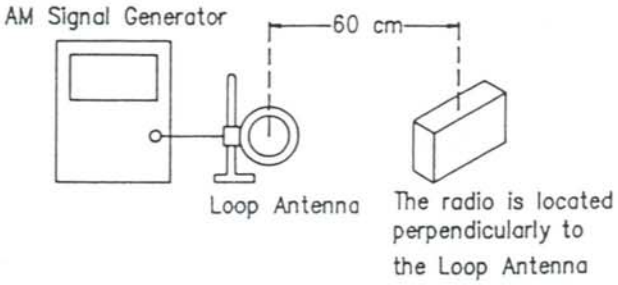
SSVM

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| AM | T115 | (1) Turn the radio ON.<br>(2) Set the bandwidth switch to WIDE and RF GAIN VR to MAX position.<br>(3) Tune the radio band frequency to 450kHz.<br>(4) Connect a AM aignal generator together with standard loop dummmy antenna and feed a stronger signal to the MW/LW ferrite bar antenna.<br>(5) Tune the generator frequency to 450kHz and set modulation depth to 30%~50%<br>(6) Connect a SSVM to speaker (TP14).<br>(7) Adjust T115 to have a min. audio output. |

c. Instrument Connection



## (10) ALIGNMENT FOR SIGNAL STRENGTH LEVEL

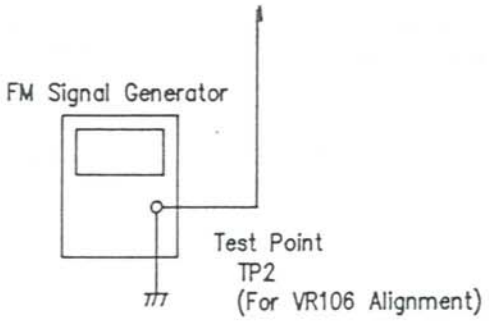
a. Required Instrument
FM Signal Generator
AM Signal Generator

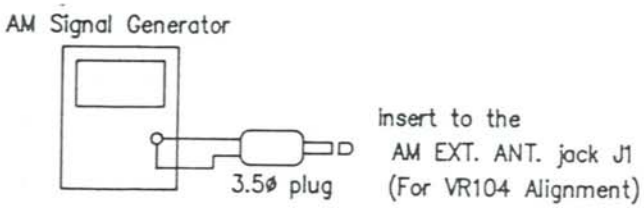
b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| FM | VR106 | (1) Turn the radio ON.<br>(2) Connect a FM signal generator to the input terminal of Rod Ant. (TP2)<br>(3) Set the signal generator to 98MHz with 1kHz Mod, 22.5Hz deviation and 36 emf dBμ/75 ohm output level.<br>(4) Tune the radio band frequency to 98MHz and adjust VR106 to have a strength level reading of 6th scale. |
| AM | VR104 | (1) Turn the radio ON.<br>(2) Set the bandwidth switch to WIDE and RF GAIN VR to MAX position.<br>(3) Tune the radio band frequency to 15.100MHz.<br>(4) Feed a signal with 30% modulation and 36 emf dBμ/50 ohm output level into the AM EXT. ANT. Jack.<br>(5) Tune the generator frequency exactly the same as that of the radio frequency displayed<br>(6) Adjust VR104 to have a strength level reading of 5th scale. |

**Caution :** Before these signal strength alignment procedures, the VR105 (for Battery level) should be in correct position.

c. Instrument Connection



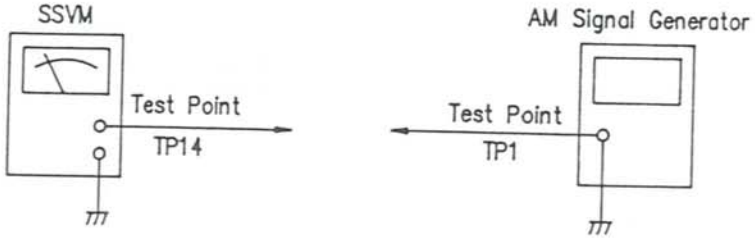
(12) ALIGNMENT FOR BFO

a. Required Instrument
Signal Generator
SSVM

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| AM | TC103 | (1) Set the power switch to ON position.<br>(2) Set the band to SW, BFO switch to ON and BFO pitch to center position.<br>(3) Feed a signal without modulation from signal generator to EXT ANT jack, and (connect a SSVM to the speaker.<br>(4) Tune the radio frequency exactly the same as that of signal generator.<br>(6) Adjust TC103 to have a minimum reading on SSVM. |

c. Instrument Connection




(13) ALIGNMENT FOR FM AUTO STOP ACCURACY

a. Required Instrument
FM Signal Generator
SSVM

b. Alignment Procedure

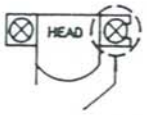
| Mode | Adjustment | Procedure |
|---|---|---|
| FM | VR101 | (1) Set the power switch to ON.<br>(2) Set FM 98 MHz.<br>(3) Connect a the output of the FM signal generator to (TP1).<br>(4) Connect SSVM to the pin 14 of IC2 (TP17 ).<br>(5) Tune the band frequency to 98MHz and adjust VR101 to have a max. 1V (show on the SSVM).<br>(6) Set FM signal generator 98.05 and 97.95 MHz to have a min. 5V (show on SSVM).<br>(7) Repeat step 5 and 6. |

c. Instrument Connection

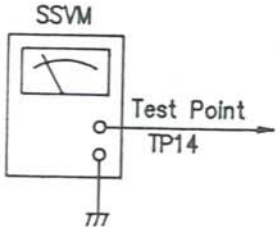
(14) ALIGNMENT FOR HEAD AZIMUTH

a. Required Instrument
SSVM
TEST TAPE (TEAC MTT-114N or equivalent)

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| TAPE PLAY |   HEAD AZIMUTH SCREW | (1) Take OFF the cassette door<br>(2) Load the TEST TAPE in.<br>(3) Set TONE VR and VOL VR to max position<br>(4) Depress the PLAY KEY<br>(5) Ajust HEAD AZIMUTH SCREW to have a max. ON VTVM reading |

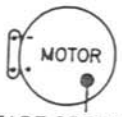
c. Instrument Connection



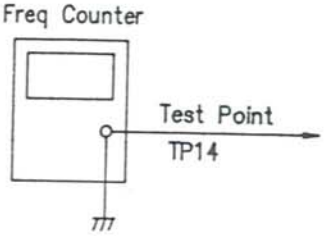

(15) ALIGNMENT FOR TAPE SPEED

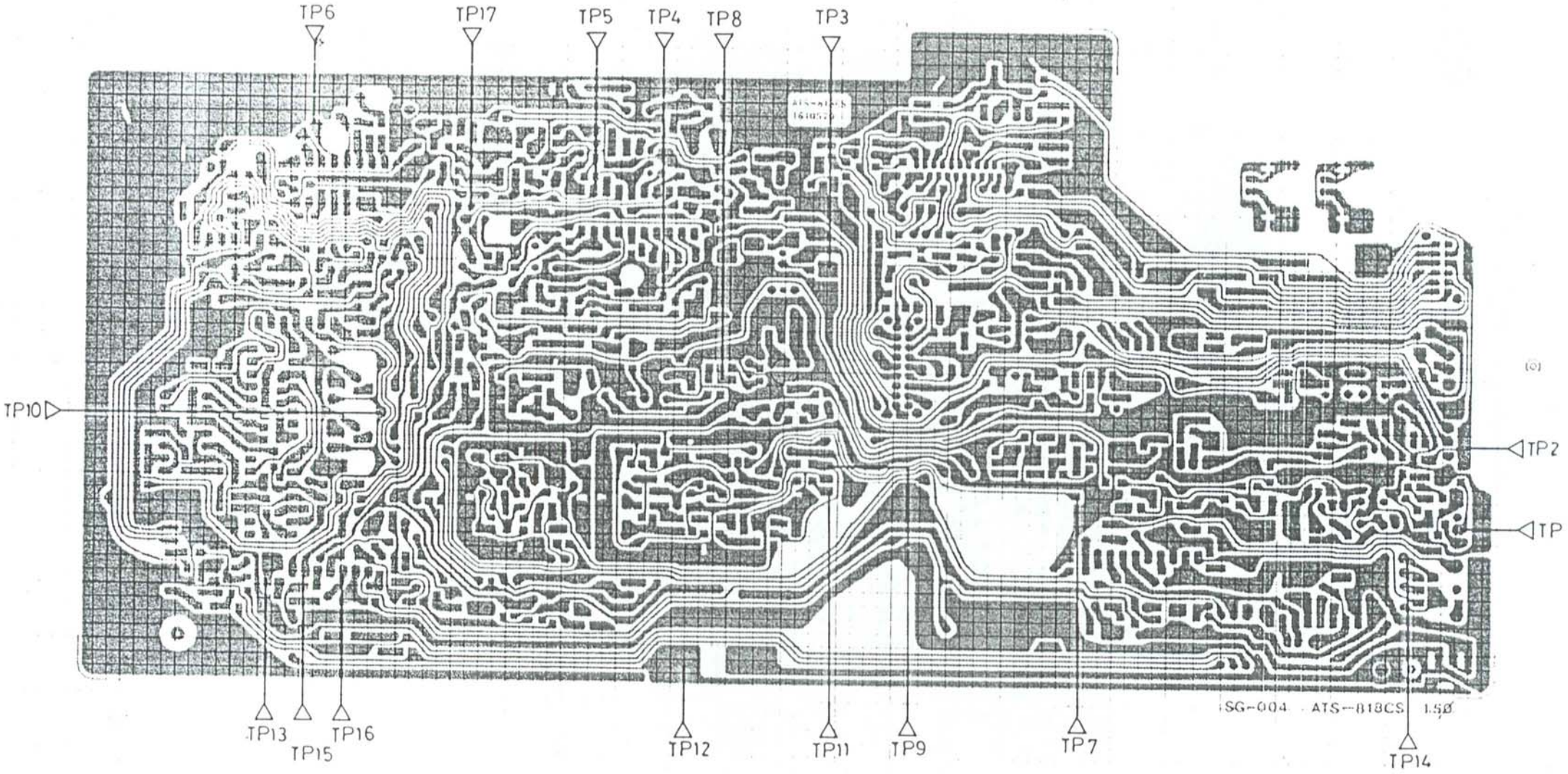
a. Required Instrumet
Frequency Counter
TEST TAPE (TEAC MTT-114N or equivalent)

b. Alignment Procedure

| Mode | Adjustment | Procedure |
|---|---|---|
| TAPE PALY |   TAPE SPEED ADJ.VR | (1) Take OFF the cassette door<br>(2) Load the TEST TAPE in.<br>(3) Ajust TAPE SPEED ADJ. VR to have a reading of 3000Hz±3% (2910Hz-3090Hz) |

c. Instrument Connection



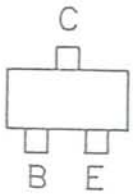

TP6
TP17
TP5
TP4
TP8
TP3
TP10
TP2
TP
TP13
TP15
TP16
TP12
TP11
TP9
TP7
TP14
SG-004 ATS-818CS 1.5Ø

# SEMICONDUCTOR LEAD IDENTIFICATION

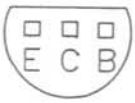
## Transistors


2SK212E


2SC2999D/E
2SC2839E




2SC1623L6/L7
2SB815B6-TA/B7
2SA812M6/M7
2SD1048X6/X7

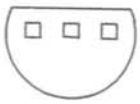



2SA1020Y


2SK381A/B


2SK715W

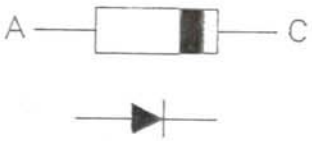

SVC-203



SVC-201SP

(E: Emitter C: Collector B: Base S: Source G: Gate D: Drain)

## Diodes

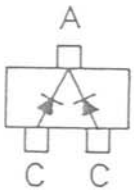



1N4148T
1N60

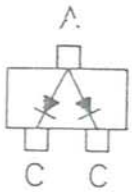

1SS98T


1SS238T
UZ-15BH

RL-S4148




1S2837A5




1S2835-T2B-A3

(A: Anode C: Cathode)

| | | FM | AM |
|---|---|---|---|
| Q144 | E | 0 | 0 |
| | B | 0.6 | 0.6 |
| | C | 0.2 | 0.2 |
| Q147 | E | 6.0 | 6.0 |
| | B | 5.9 | 5.9 |
| | C | 0 | 0 |
| Q148 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 0 | 0 |
| C151 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 0 | 0 |
| Q158 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 0 | 0 |
| Q159 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 0 | 0 |

| | | Radio | Tape | |
|---|---|---|---|---|
| | | | Play | Cue Review |
| Q160 | E | 0.1 | 5.78 | 5.78 |
| | B | 0.24 | 5.76 | 5.03 |
| | C | – 1.07 | – 1.1 | 5.73 |
| Q161 | E | 0 | 0 | 0 |
| | B | – 1.18 | – 1.12 | 0.64 |
| | C | 0 | 1.78 | 0 |

| | | Radio | Tape |
|---|---|---|---|
| Q131 | E | 3.0 | 3.0 |
| | B | 2.4 | 5.4 |
| | C | 2.96 | 0.2 |
| Q149 | E | 0 | 6.0 |
| | B | 0 | 5.3 |
| | C | 0 | 5.9 |
| Q150 | E | 0 | 0 |
| | B | 0 | 0.6 |
| | C | 0 | 0.3 |
| Q153 | E | 0 | 1.78 |
| | B | 0.47 | 2.38 |
| | C | 0 | 1.8 |
| Q154 | E | 0 | 0 (CRO2) |
| | B | 0 | 0.66(CRO2) |
| | C | 0 | 0 (CRO2) |
| Q155 | E | 0 | 5.47(CRO2) |
| | B | 0 | 4.86(CRO2) |
| | C | 0 | 5.44(CRO2) |
| Q157 | E | 0 | 0 |
| | B | 0.6 | 1.01 |
| | C | 0.2 | 0.42 |
| Q146 | E | 5.6 | 5.7 |
| | B | 4.8 | 5.3 |
| | C | 5.55 | 0.4 |
| Q145 | E | 4.6 | 1.6 |
| | B | 4.7 | 1.1 |
| | C | 2.5 | 1.3 |

## STANDBY RELEASE

| | | Off | On |
|---|---|---|---|
| Q140 | E | 6.0 | 6.0 |
| | B | 6.0 | 6.0 |
| | C | 0 | 5.9 |
| Q141 | E | 0 | 0 |
| | B | 0 | 0.6 |
| | C | 5.9 | 0.2 |
| TYPE | | PLAY | REC |
| Q152 | E | 0 | 0.04 |
| | B | 0 | 0.5 |
| | C | 5.9 | 1.5 |

## LIGHT

| Pin No. | Off | On |
|---|---|---|
| 1 | 5.8 | 5.8 |
| 2 | 5.8 | 5.8 |
| 3 | 0 | 0 |
| 4 | 0 | 5.8 |
| 5 | 5.8 | 5.8 |

## IC103

| Pin No. | FM | AM |
|---|---|---|
| 1 | 5.6 | 5.6 |
| 2 | 0 | 0 |
| 3 | 3.0 | 3.0 |
| 4 | 5 | 5 |

| | | FM | AM |
|---|---|---|---|
| Q132 | E | 0 | (LW) (MW) 0.2 |
| | B | 0 | (LW) (MW) 0 |
| | C | 0 | (LW) (MW) 4.5 |
| Q133 | E | 8.3 | 2 |
| | B | 8.1 | 1.8 |
| | C | 1.5 | 2.8 |
| Q134 | E | 0 | 0 |
| | B | 0 | 0.66 |
| | C | 0 | 0 |
| Q135 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 0 | 0.66 |
| Q136 | E | 0 | 5.47 |
| | B | 0 | 5.44 |
| | C | 0 | 0 |
| Q137 | E | 0 | 5.47 |
| | B | 0 | 4.86 |
| | C | 0 | 5.44 |
| Q138 | E | 0.3 | 0.3 |
| | B | 0.9 | 0.9 |
| | C | 1.9 | 1.9 |
| Q139 | E | 0.3 | 0.3 |
| | B | 0.9 | 0.9 |
| | C | 1.9 | 1.9 |
| Q142 | E | 6.0 | 6.0 |
| | B | 5.4 | 5.4 |
| | C | 5.8 | 5.8 |
| Q143 | E | 6.0 | 6.0 |
| | B | 5.4 | 5.4 |
| | C | 5.9 | 5.9 |

| | | FM | AM |
|---|---|---|---|
| Q111 | E | 0 | 0.5 |
| | B | 0 | 0 |
| | C | 0 | 0 |
| Q112 | E | 0 | 0 |
| | B | 0 | 0.68 |
| | C | 0 | 1.12 |
| Q113 | E | 0 | 0.3 |
| | B | 0 | 0.66 |
| | C | 0 | 1.2 |
| Q114 | S | 0 | (SSB) 0 |
| | G | 0 | (SSB) 0.6 |
| | D | 0 | (SSB) 0 |
| Q115 | E | 3.00 | 3.00 |
| | B | 4.9 | 2.4 |
| | C | 0 | 2.9 |
| Q116 | E | 0 | 0 |
| | B | 0.6 | 0 |
| | C | 0 | 1.5 |
| Q117 | E | 2.7 | 2.7 |
| | B | 3.3 | 3.3 |
| | C | 2.8 | 2.8 |
| Q118 | E | 0 | 0 |
| | B | 0.72 | 0.72 |
| | C | 1.73 | 1.73 |
| Q119 | E | 0.6 | 0.6 |
| | B | 1.3 | 1.3 |
| | C | 1.5 | 1.5 |
| Q120 | E | 0 | 0 |
| | B | 0.7 | 0.7 |
| | C | 1.64 | 1.64 |

| | | FM | AM |
|---|---|---|---|
| Q121 | E | 0 | 0 |
| | B | 0.25 | 0.2 |
| | C | 3.00 | 3.00 |
| Q122 | E | 0 | 0 |
| | B | −1.88 | (LW) 0<br>(MW) |
| | C | −0.38 | (LW)<br>(MW) 0 |
| Q123 | E | 0 | (LW) 0<br>(MW) |
| | B | −0.38 | (LW)<br>(MW) 0 |
| | C | 5.62 | (LW)<br>(MW) 0 |
| Q124 | E | 5.67 | (LW) 5.67<br>(MW) |
| | B | 5.1 | (LW) 5.5<br>(MW) |
| | C | 5.64 | (LW)<br>(MW) 0.3 |
| Q125 | S | 5.6 | (LW) 5.6<br>(MW) |
| | G | 5.5 | 4.9 |
| | D | 0 | 5.5 |
| Q126 | E | 0 | 3.00 |
| | B | 0 | 2.45 |
| | C | 0 | 0 |
| Q127 | E | 0 | 0 |
| | B | 0 | 0.6 |
| | C | 1.36 | 0 |
| Q128 | E | 0 | 0 |
| | B | 0.6 | 0 |
| | C | 0 | 1.22 |
| Q129 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 0 | 2.44 |
| Q130 | E | 5.55 | 5.55 |
| | B | 4.86 | 5.43 |
| | C | 5.5 | 0 |

# Transistors

| | | FM | AM |
|---|---|---|---|
| Q1 | E | 0 | 0 |
| | B | 0.61 | 0 |
| | C | 0.07 | 5.30 |
| Q2 | E | 0 | 0 |
| | B | 0 | 0.61 |
| | C | 4.93 | 0.07 |
| Q3 | E | 0 | 0.92 |
| | B | 0 | 0 |
| | C | 0.46 | 5.96 |
| Q4 | E | 0 | 0 |
| | B | 0.66 | 0.66 |
| | C | 0.07 | 0.07 |
| Q5 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 6.00 | 6.00 |
| Q6 | E | 0.93 | 0.94 |
| | B | 0.68 | 0.69 |
| | C | 2.63 | 2.63 |
| Q7 | E | 0 | 0 |
| | B | 0.61 | 0.61 |
| | C | 9.3 | 1.2 |
| Q8 | E | 0 | 0 |
| | B | 0 | 0.6 |
| | C | 5.8 | 0.3 |
| Q9 | E | 0.51 | 0.51 |
| | B | 1.35 | 1.35 |
| | C | 3.00 | 3.00 |
| Q10 | E | 3.00 | 3.00 |
| | B | 2.6 | 2.6 |
| | C | 3.00 | 3.00 |

| | | FM | AM |
|---|---|---|---|
| Q101 | E | 0 | (LW) 0<br>(MW) |
| | B | 0 | (LW) 0.6<br>(MW) |
| | C | 0 | (LW) 0<br>(MW) |
| Q102 | E | 0 | 0 |
| | B | 0 | 0 |
| | C | 4.02 | 0 |
| Q103 | E | 0 | 0 |
| | B | 0.65 | 0 |
| | C | 4.00 | 0 |
| Q104 | E | 0 | 0 |
| | B | 0.6 | 0.6 |
| | C | 0 | 0 |
| Q105 | E | 0 | 0 |
| | B | 0 | 0.7 |
| | C | 0 | 0 |
| Q106 | E | 0 | (SSB) 0.02 |
| | B | 0 | (SSB) 0.6 |
| | C | 0 | (SSB) 1.36 |
| Q107 | E | 0 | (SSB) 0 |
| | B | 0 | (SSB) 0.6 |
| | C | 0 | (SSB) 1.2 |
| Q108 | E | 0 | 0.24 |
| | B | 0 | 0 |
| | C | 0 | 4.75 |
| Q109 | E | 0 | 0.37 |
| | B | 0 | 0 |
| | C | 0 | 0.37 |
| Q110 | E | 0 | 0.37 |
| | B | 0 | 0 |
| | C | 0 | 3.7 |

## IC106

| Pin No. | PLAY | REC |
|---|---|---|
| 1 | 5.86 | 5.86 |
| 2 | 1.8 | 1.8 |
| 3 | 2.0 | 2.0 |
| 4 | 2.0 | 2.0 |
| 5 | 2.0 | 2.0 |
| 6 | 0 | 0 |
| 7 | 2.0 | 2.0 |
| 8 | 2.0 | 2.0 |
| 9 | 2.0 | 2.0 |
| 10 | 2.0 | 2.0 |
| 11 | 0 | 0 |
| 12 | 2.0 | 2.0 |
| 13 | 0 | 0 |
| 14 | 2.0 | 2.0 |
| 15 | 2.0 | 2.0 |
| 16 | 2.0 | 2.0 |
| 17 | 2.0 | 2.0 |
| 18 | 0 | 1.8 |
| 19 | 2.0 | 2.0 |
| 20 | 0 | 0 |
| 21 | 2.0 | 2.0 |

## IC5

| Pin No. | FM | AM |
|---|---|---|
| 1 | 5.8 | 5.8 |
| 2 | 0 | 0 |
| 3 | 3 | 3 |

## IC1

| Pin No. | FM | AM |
|---|---|---|
| 1 | – 1.38 | – 1.37 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 3.0 | 3.0 |
| 5 | 1.2 | 1.2 |
| 6 | 1.11 | 1.11 |
| 7 | 0.68 | 0.68 |
| 8 | 0.01 | 0.01 |
| 9 | 0.01 | 0.01 |
| 10 | 0 | 0 |
| 11 | 1.4 | 1.39 |
| 12 | 2.88 | 2.88 |
| 13 | 0 | 0 |
| 14 | 0 | 0 |

## IC109

| Pin No. | FM | AM |
|---|---|---|
| 1 | 5.9 | 5.9 |
| 2 | 0 | 0 |
| 3 | 3.2 | 3.2 |
| 4 | 0.6 | 0.6 |
| 5 | 5.7 | 5.7 |
| 6 | 5.9 | 5.9 |
| 7 | 0 | 0 |
| 8 | 1.4 | 1.4 |
| 9 | 0 | 0 |

## IC108

| Pin No. | FM | AM |
|---|---|---|
| 1 | 3.00 | 3.00 |
| 2 | 3.00 | 3.00 |
| 3 | 3.00 | 3.00 |
| 4 | 3.00 | 3.00 |
| 5 | 0 | 0 |
| 6 | 3.00 | 3.00 |
| 7 | 3.00 | 3.00 |
| 8 | 0 | 0 |
| 9 | 3.00 | 3.00 |
| 10 | 0 | 0 |
| 11 | 3.00 | 3.00 |
| 12 | 3.00 | 3.00 |
| 13 | 3.00 | 3.00 |
| 14 | 0 | 0 |
| 15-16 | 3.00 | 3.00 |

## IC107

| Pin No. | FM | AM |
|---|---|---|
| 1 | 5.9 | 5.9 |
| 2 | 0 | 0 |
| 3 | 3.2 | 3.2 |
| 4 | 0.6 | 0.6 |
| 5 | 5.7 | 5.7 |
| 6 | 5.9 | 5.9 |
| 7 | 0 | 0 |
| 8 | 1.4 | 1.4 |
| 9 | 0 | 0 |

IC2

| Pin No. | FM | AM |
|---|---|---|
| 1-15 | LCD Segment | |
| 16 | 1.57 | 1.57 |
| 17 | 3.2 | 0 |
| 18 | 0 | 3.2 |
| 19 | 0 | 0 |
| 20 | 0 | 0 |
| 21-24 | LCD Back Plane | |
| 25 | 3.7 | 3.7 |
| 26 | 3.7 | 3.7 |
| 27 | 2.15 | 2.15 |
| 28 | 1.08 | 1.08 |
| 29 | 3.66 | 3.66 |
| 30 | 0 | 0 |
| 31 | 0 | 0 |
| 32 | 0 | 0 |
| 33 | 0 | 0 |
| 34 | 0 | 0 |
| 35 | 0 | 0 |
| 36 | 0 | 0 |
| 37 | 3.66 | 3.66 |
| 38 | 3.2 | |
| 39 | 3.66 | 3.66 |
| 40 | 3.66 | 3.66 |
| 41 | 3.66 | 3.66 |
| 42 | 3.66 | 3.66 |
| 43 | 3.66 | 3.66 |

IC2

| Pin No. | FM | AM |
|---|---|---|
| 44 | 3.66 | 3.66 |
| 45 | 3.66 | 3.66 |
| 46 | 0 | 0 |
| 47 | 0 | 0 |
| 48 | 0 | 0 |
| 49 | 0 | 0 |
| 50 | 0 | 0 |
| 51 | 0 | 0 |
| 52 | 0 | 0 |
| 53 | 3.7 | 3.7 |
| 54 | 3.7 | 3.7 |
| 55 | 0 | 0 |
| 56 | 3.7 | 3.7 |
| 57 | 0 | 0 |
| 58 | 1.47 | 1.47 |
| 59 | 1.50 | 1.50 |
| 60 | 3.1 | 3.1 |
| 61 | 3.7 | 3.7 |
| 62 | 3.7 | 3.7 |
| 63 | 3.7 | 3.7 |
| 64 | 3.7 | 3.7 |
| 65 | 3.7 | 3.7 |
| 66 | 3.7 | 3.7 |
| 67 | 3.7 | 3.7 |
| 68 | 3.7 | 3.7 |
| 69-80 | LCD Segment | |

IC105

| Pin No. | FM | AM |
|---|---|---|
| 1 | 3.66 | 3.66 |
| 2 | 3.66 | 3.66 |
| 3 | 3.66 | 3.66 |
| 4 | 0 | 0 |
| 5 | 1.05 | 0.88 |
| 6 | 0.75 | 0.70 |
| 7 | 0.94 | 0.79 |
| 8 | 0.75 | 0.7 |
| 9 | 0.97 | 0.82 |
| 10 | 0.75 | 0.7 |
| 11 | 1.05 | 0.88 |
| 12 | 0 | 0 |
| 13-14 | 3.66 | 3.66 |

# IC AND TRANSISTOR VOLTAGE CHART

IC101

| Pin No. | FM | AM |
|---|---|---|
| 1 | 4.39 | 3.80 |
| 2 | 1.66 | 1.66 |
| 3 | 1.83 | 1.60 |
| 4 | 1.27 | 1.79 |
| 5 | 1.38 | 1.60 |
| 6 | 1.38 | 1.60 |
| 7 | 5.35 | 5.30 |
| 8 | 2.60 | 2.25 |
| 9 | 5.35 | 5.30 |
| 10 | 5.05 | 0 |
| 11 | 0 | 0 |
| 12 | 1.50 | 1.59 |
| 13 | 0 | 2.35 |
| 14 | 2.97 | 2.97 |
| 15 | 1.12 | 1.08 |
| 16 | 1.12 | 1.08 |
| 17 | 2.38 | 2.33 |
| 18 | 1.77 | 1.46 |
| 19 | 1.66 | 1.66 |
| 20 | 1.66 | 1.66 |

IC4

| Pin No. | FM | AM |
|---|---|---|
| 1 | 4.2 | 4.2 |
| 2 | 0 | 0 |
| 3 | 3.00 | 3.00 |

IC102

| Pin No. | FM | AM |
|---|---|---|
| 1 | 2.86 | 2.86 |
| 2 | 0.46 | 0.46 |
| 3 | 0.46 | 0.46 |
| 4 | 0.93 | 0.93 |
| 5 | 0.93 | 0.93 |
| 6 | 0.02 | 0.02 |
| 7 | 2.99 | 2.99 |
| 8 | 0 | 0 |
| 9 | 1.04 | 1.04 |
| 10 | 0.45 | 0.45 |
| 11 | 1.17 | 1.17 |
| 12 | 1.32 | 1.32 |
| 13 | 1.43 | 1.43 |
| 14 | 1.15 | 1.15 |
| 15 | 1.15 | 1.15 |
| 16 | 0.02 | 0.02 |

IC104

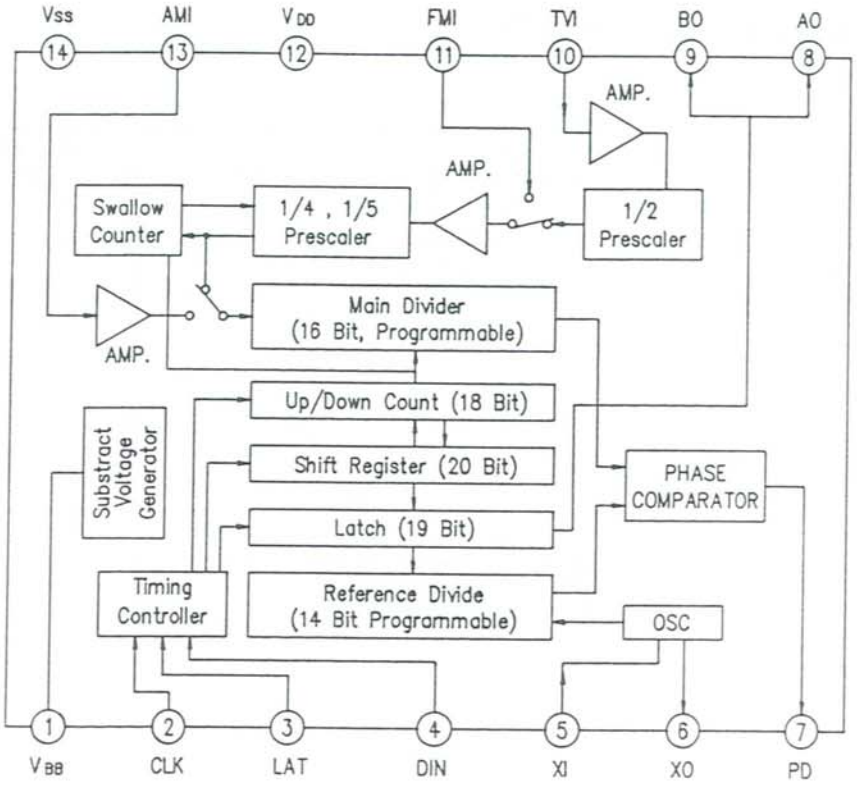
| Pin No. | FM | AM |
|---|---|---|
| 1 | 3.00 | 3.00 |
| 2 | 3.00 | 3.00 |
| 3 | 3.00 | 3.00 |
| 4 | 0.75 | 0.75 |
| 5 | 1.11 | 0.94 |
| 6 | 0.75 | 0.70 |
| 7 | 1.19 | 1.00 |
| 8 | 0.75 | 0.7 |
| 9 | 1.24 | 1.04 |
| 10 | 0.75 | 0.7 |
| 11 | 1.27 | 1.07 |
| 12 | 0 | 0 |
| 13-14 | 3.00 | 3.00 |

## Testing Conditions:

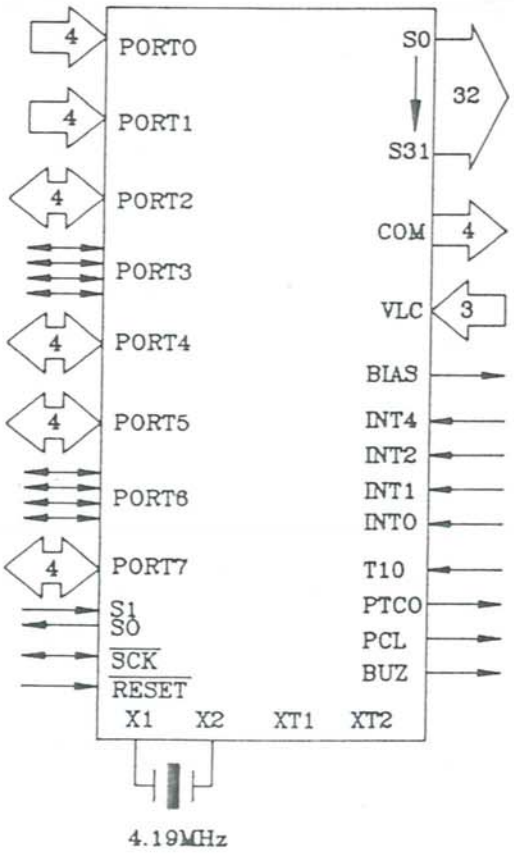
1. No input signal and volume set to minimum.
2. Speaker mode.
3. External antenna is not used.
4. AM is received by 150kHz and put on the wide, BFO is off, and AM RF gain is maximum.
5. FM is received by 98MHz and set to the stereo position.
6. Install a 6.0V radio battery and a 4.5V backup battery.
7. Unit of measure: volts.

# IC CIRCUIT BLOCK DIAGRAMS

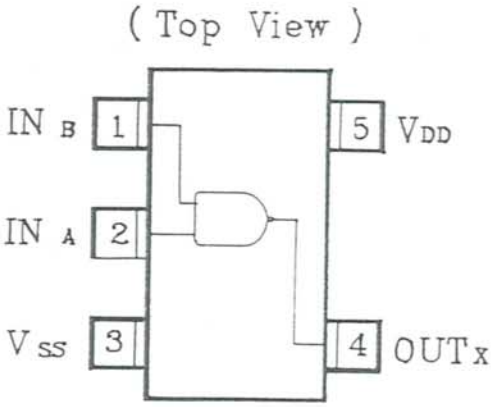
1. IC1-CXD1118M-1



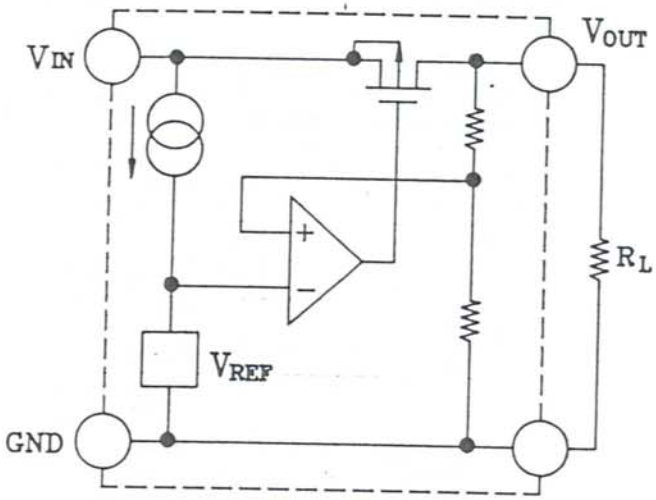

2. IC2-UPD 75308GF-508



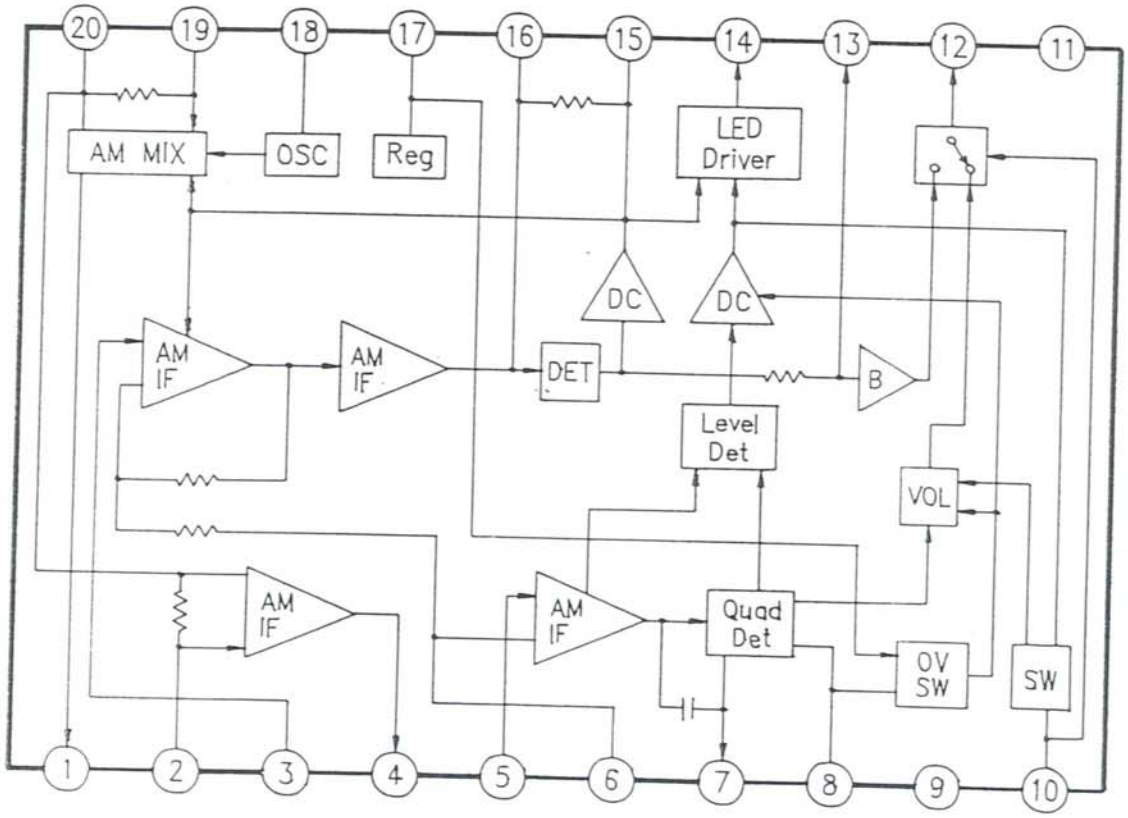

3. IC3-TC4S11F



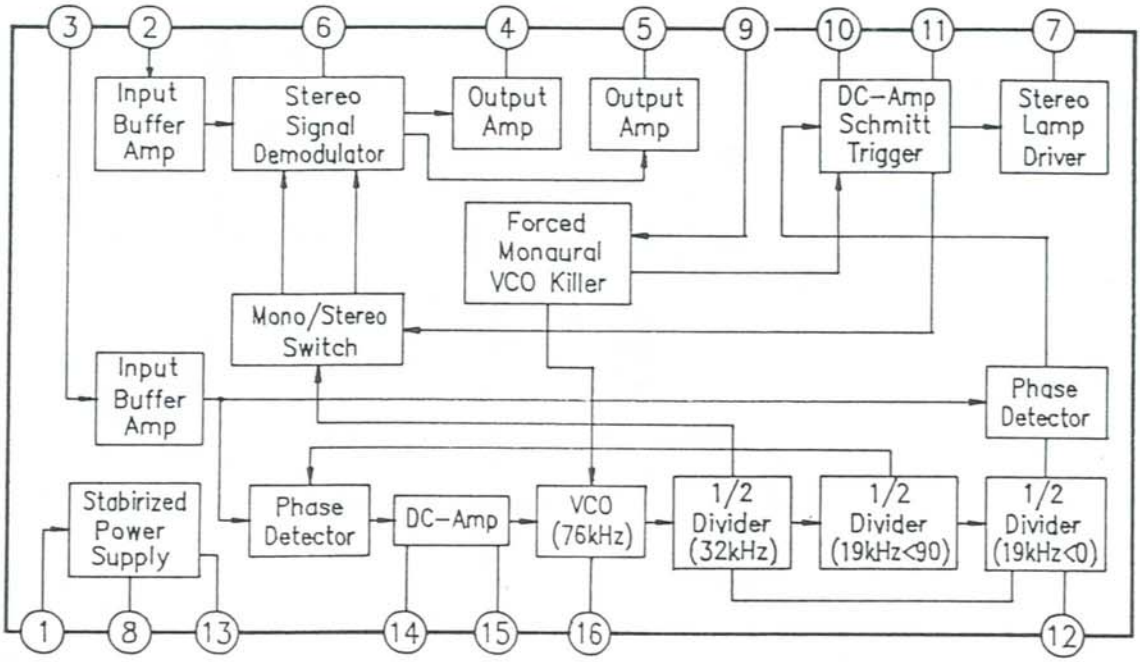
4. IC4, 5-S-81230AG-RE-T2



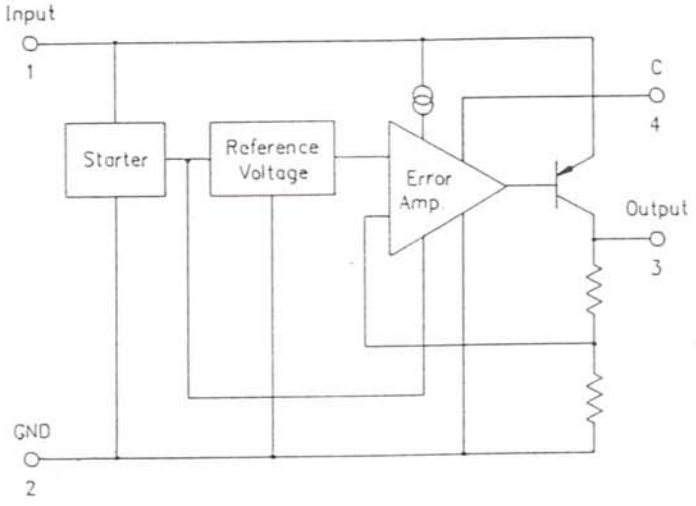

5. IC101-TA7758P



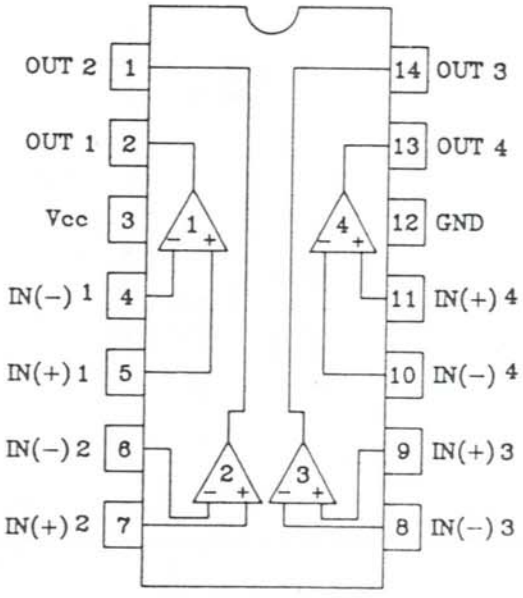
## 6. IC102-AN7415



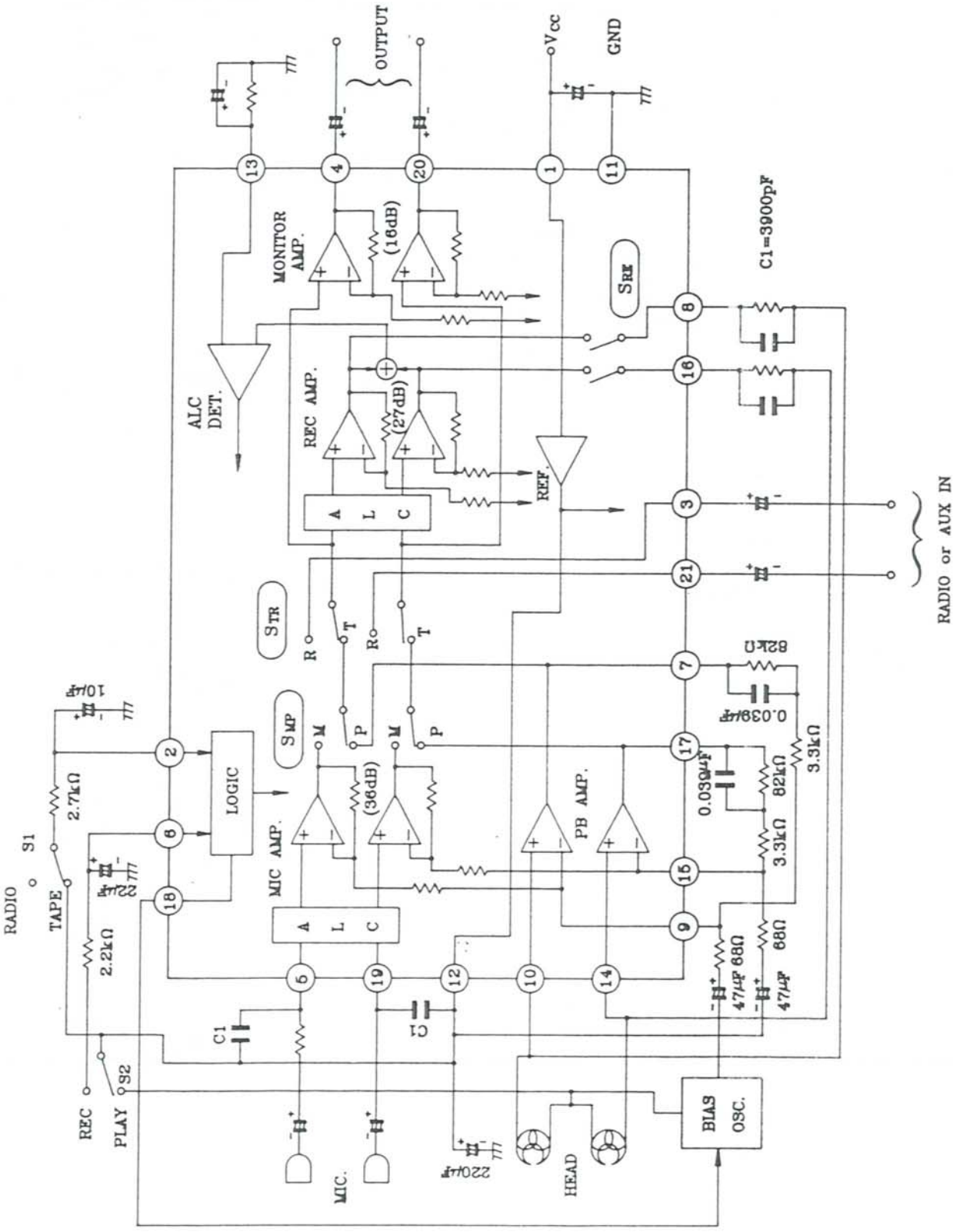

## 7. IC103-LA5003



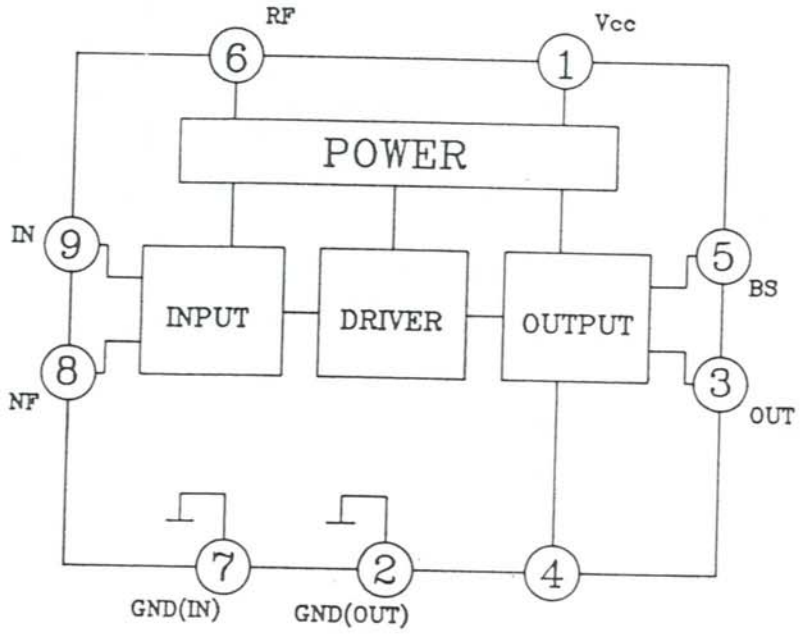

## 8. IC104, 105-TA75339P



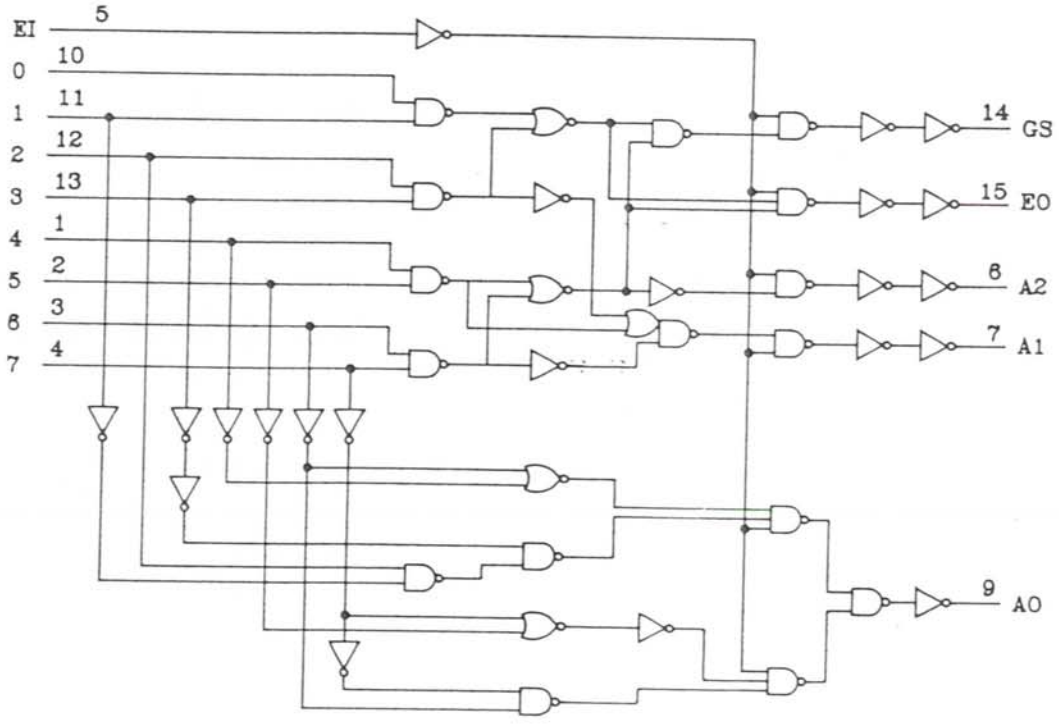
9. IC106-TA7417AP



10. IC107, 109-AN7141N




11. IC108-TC74HC148AP



# SCHEMATIC DIAGRAM

| 機型 MODEL NO. | 品名 TITLE | 圖號 DWG NO. | 檢圖 CHECKED | 製圖 DRAWN |
|---|---|---|---|---|
| ROBERTS ATS-818CS | CIRCUIT DIAGRAM | | | HWANG |

| 製圖日期 DRAWN DATE | 修改日期 EDIT DATE | 修改日期 EDIT DATE | 修改日期 EDIT DATE | 修改日期 EDIT DATE |
|---|---|---|---|---|
| 81.02.19 | 版 81.01.31 | 版 82.8.5 | 版 | 版 |

山進電子工業股份有限公司 *SANGEAN* ELECTRONICS INC.

| | END | BLANK |
|---|---|---|
| R | 62 | 45,47,48 |
| Q | 10 | 9 |
| C | 47 | 12~19,22 32~43 |
| D | 17 | |
| SW | 6 | |
| VR | 3 | |

* D4 : 26100kHz
* D5 : 76MHz
* D3 : 100kHz

# SCHEMATIC DIAGRAM