

This Information Is Provided By
CBTricks.com

Uniden PRO-310e Service Manual

Liability of damages to any equipment is the sole responsibility of the user! Downloading, viewing, or using any information provided on these pages automatically accepts the user to the terms of this agreement!

Modifications are provided for information purposes only!

Supporters of CBTricks.com paid for the hosting so you would have this file.

CBTricks.com is a non-commercial personal website was created to help promote the exchange of service, modification, technically oriented information, and historical information aimed at the Citizens Band, GMRS (CB "A" Band), MURS, Amateur Radios and RF Amps.

CBTricks.com is not sponsored by or connected to any Retailer, Radio, Antenna Manufacturer or Amp Manufacturer, or affiliated with any site links shown in the links database. The use of product or company names on my web site is not endorsement of that product or company.

The site is supported with donations from users, friends and selling of the Site Supporters DVD's to cover some of the costs of having this website on the Internet instead of relying on banner ads, pop-up ads, commercial links, etc. Thus I do not accept advertising banners or pop-up/pop-under advertising or other marketing/sales links or gimmicks on my website.

ALL the money from donations is used for CBTricks.com I didn't do all the work to make money (I have a day job). This work was not done for someone else to make money also, for example the ebay CD sellers.

All Trademarks, Logos, and Brand Names are the property of their respective owners.

This information is not provided by, or affiliated in any way with any radio or antenna Manufacturers.

Thank you for any support you can give.

For information on how to Support CBTricks.com

<http://www.cbtricks.com/support/>

uniden[®]

CB TRANSCEIVER

MODEL: PRO 310e

SERVICE INFORMATION MANUAL

UNIDEN CUSTOMER SERVICE & PARTS
9900 Westpoint Drive
Indianapolis, IN 46256
(317) 842-2483

CB TRANSCEIVER

MODEL : PRO 310e

TABLE OF CONTENTS

- 1. SPECIFICATIONS**
- 2. ALIGNMENT PROCEDURE**
- 3. ALIGNMENT POINTS**
- 4. IC VOLTAGE CHART**
- 5. SEMICONDUCTOR LEAD IDENTIFICATION**
- 6. PARTS PRICE LIST**
- 7. FREQUENCY CHART**
- 8. TECHNICAL DRAWINGS**
 - BLOCK DIAGRAM**
 - SCHEMATIC DIAGRAM (E12-2581)**
 - WIRING DIAGRAM (E32-2682)**
 - P.C.BOARD TOP VIEW**
 - MAIN P.C.B. (E22-6670)**
 - LED P.C.B. (E23-6671)**

1. SPECIFICATIONS

CB/AM EMERGENCY TRANSCEIVER MODEL : PRO 310e (UT-311Z)

GENERAL

1. Channels : 40
2. Frequency Range : 26.965 MHz to 27.405 MHz
3. Semiconductors : 24 Transistors, 32 Diodes, 6 ICs
4. Crystal Oscillators : 1
5. Microphone : Electret Condenser Type
6. Speaker : 16 ohm, 0.4 W
7. Antenna Connector : RCA Type : For Roof Mount Antenna
5/16" Screw Type : For Portableuse
8. Jacks & Connector : DC Power Jack
9. Controls : Channel Selector UP/Down
Power Switch & Volume, Squelch
10. Illuminations : Channel Readout (LED Green),
TX Indicator (LED Red)
Battery Low (LED Red)
11. Size : W : 67mm with W : 67mm without
H : 220mm Battery Pack H : 220mm Battery Pack
D : 40.5mm D : 40.5mm
12. Weight : 335 g 260 g
13. Accessories : Magnet Base for Roof Mount Antenna,
Telescopic Antenna Element, DC Power
Cord with Cigarette Lighter Plug and
Fuse Holder (Built-in 2A Fuse)
14. Grounding : Both Negative, Positive

MEASUREMENT CONDITIONS

- 1. Power Source : 13.8 V (DC)
- 2. Antenna Impedance : 50 ohm
- 3. Test Temperature : 25°C
- 4. Modulation Frequency : 1 kHz
- 5. Mean Signal Input Level : 1000 uV
- 6. Reference Audio Output Power : 0.05 W
- 7. Reference Modulation Percentage : 1 kHz 30 %
- 8. Audio Output Load : 8 ohm Resistive
- 9. Measuring Channel : 19

NOTE : Limit specifications are for measurements on all channels.

TRANSMITTER SECTION

<u>ITEMS</u>	<u>UNIT</u>	<u>NOMINAL</u>	<u>LIMIT</u>
1. Frequency Tolerance at 25°C (5 minutes after Switch on)	%	±0.002	±0.003
2. Carrier Power at No Modulation (High Power)	W	3.5	3 to 4
(Low Power)	W	1.0	0.7 to 1.5
3. Spurious Harmonic Emission	dB	-70	-60
4. Microphone Sensitivity at 1 kHz for 50 % Mod.	mV	8	15
5. Modulation Frequency Response (1 kHz, 0 dB Reference)			
Lower at 300 Hz	dB	-6	-12
Upper at 3.0 kHz	dB	-3	-12
6. AMC Range 50 to 100 % Mod.	dB	36	30
7. Hum and Noise in Transmit	dB	50	40
8. Battery Drain at No Modulation (High Power)	mA	700	1000
(Low Power)	mA	450	600

<u>ITEMS</u>	<u>UNIT</u>	<u>NOMINAL</u>	<u>LIMIT</u>
9. Battery Drain at Max Modulation			
(High Power)	mA	1000	1400
(Low Power)	mA	600	900
10. Output Protection : Shall meet for 5 minutes for all VSWR's (around the Smith Chart) of 20:1 without damage.			
11. Output stability at all VSWR's (around the Smith Chart) of up to 5 : 1 under continuous operation of a duty cycle of 5 minutes transmitting, and 1 minute receiving.			

RECEIVER SECTION

1. Max. Sensitivity	uV	0.5	1
2. Sensitivity for 10 dB S+N/N	uV	0.7	1.2
3. AGC Figure of Merit 50 mV for 10 dB Change in Audio Output	dB	90	75
4. Overall Audio Fidelity at 6 dB down			
Upper Frequency (1 kHz = 0 dB Ref.)	Hz	2500	2000 min
Lower Frequency	Hz	300	450 max
5. Adjacent Channel Selectivity (Single Generator)	dB	70	50
6. Maximum Audio Output Power	W	0.3	0.25
7. Audio Output Power at 10 % THD	W	0.25	0.2
8. Hum and Noise Ratio at Input 1 mV	dB	30	25
9. Squelch Sensitivity at Threshold	uV	0.1	1
10. Squelch Sensitivity at Tight	uV	1000	250 to 4000
11. Image Rejection Ratio (910 kHz)	dB	75	55

<u>ITEMS</u>	<u>UNIT</u>	<u>NOMINAL</u>	<u>LIMIT</u>
12. IF Rejection Ratio 1st and 2nd			
	dB	75	60
13. 1/2 IF Rejection Ratio	dB	70	55
14. Oscillator Dropout Volatge	V	6	9
15. Battery Drain (at DC Power Jack +13.8 V)			
(a) Un Squelched-No Signal	mA	110	160
(b) Un Squelched-Max Power	mA	320	550
(c) Squelched	mA	100	130
16. Battery Drain (at Battery Contact +12 V)			
(a) Un Squelched-No Signal	mA	100	150
(b) Un Squelched-Max Power	mA	300	500
(c) Squelched	mA	60	85

OTHER

1. Back up current drain at 12 V Supply			
	uA	80	120

2. ALIGNMENT PROCEDURE

1. ALIGNMENT OF P.L.L. PORTION

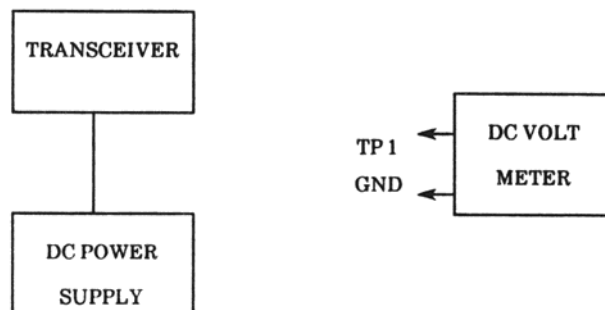
1-1. Test Equipment Required

- a. Oscilloscope (0 - 50 MHz)
- b. DC Power Supply (13.8 V)
- c. DC Voltmeter (10 V maximum, 100 kohm./V)

1-2. Alignment Procedure

STEP	PRESET TO	ADJUSTMENT	REMARKS
1	TX Mode CH : 40 No Modulation	L 13	Connect DC Voltmeter to TP 2. Adjust for approx. 4.3 V on DC Voltmeter.
2	RX Mode CH : 40 No Modulation	CT 1	Same as step 1.

1-3. Test Equipment Connection



2. ALIGNMENT OF TRANSMITTER PORTION

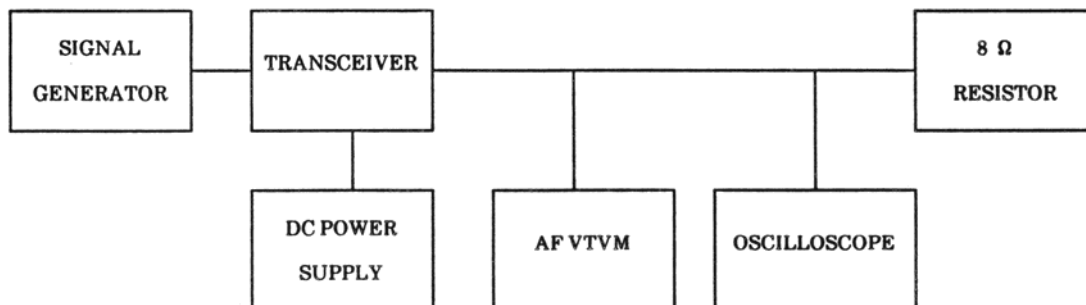
2-1. Test Equipment Required

- | | |
|---|--|
| a. DC Power Supply (13.8 V, 2 A) | e. RF Power Meter |
| b. Oscilloscope (0 - 50 MHz) | f. Field Strength Meter |
| c. Dummy Load (50 ohm, 100 ohm)
& Attenuator | g. Frequency Counter (0 - 50 MHz) |
| d. AF Generator (Audio Frequency
Oscillator) | h. RF SSVM (RF Voltmeter, Full
scale : 1 V DC, with RF probe) |

2-2. Alignment Procedure

STEP	PRESET TO	ADJUSTMENT	REMARKS
1	CH : 19 No. mod. TX mode	L 11, L12	Connect probe of RF SSVM to TP 1. Adjust coils for maximum reading.
2	Same as above.	L 7, L 10	Connect RF Power Meter to ANT. jack (J 4). Adjust coils for maximum reading.
3	Same as step 1	L 7	Adjust for 3.8 W on RF power meter.
4	Repeat above adjustments to confirm the adjustments were made correctly.		

2-3. Test Equipment Connection



3. ALIGNMENT OF RECEIVER PORTION

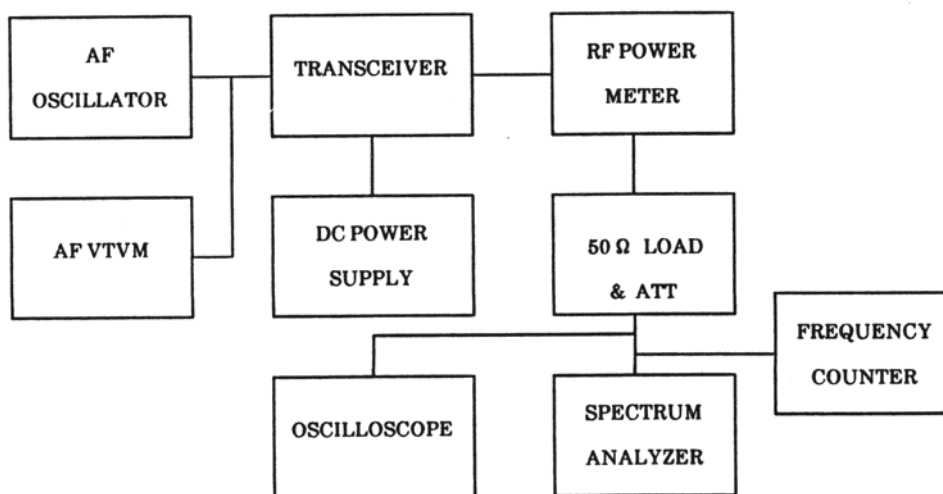
3-1. Test Equipment Required

- a. RF Signal Generator (27 MHz Band, 1000 Hz, 30 % Modulation & output Impedance 50 ohm)
- b. AF VTVM
- c. Oscilloscope (0 - 50 MHz)
- d. Dummy Load (8 ohm, 5 watts, resistive)
- e. DC Power Supply (13.8 V)
- f. DC Voltmeter

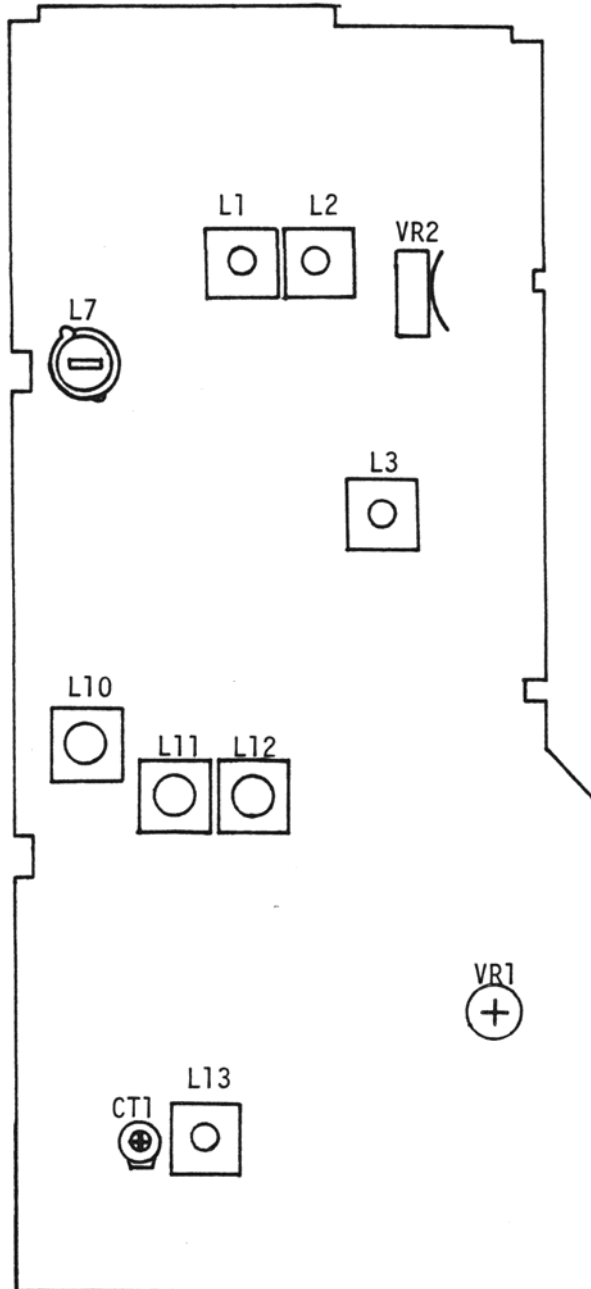
3-2. Alignment Procedure

STEP	PRESET TO	ADJUSTMENT	REMARKS
1	RX Mode. VOL : Max. SQL : Min. CH : 19	L 1, L 2, L 3	Connect RF SSG to ANT. Connector (J 4) and set it 27.185 MHz. Connect AF VTVM to SPK. Adjust coils for maximum reading on AF VTVM.
2	Same as above.	VR 2	Set the RF Signal Generator to 0.25 uV output level. Adjust VR 2 for 0.6 V on AF VTVM.
3	Same as step 1. except SQL : Max.	VR 1 (Squelch)	Set the RF Signal Generator to 1000 uV output level. Adjust VR 1 for 0.6 V on AF VTVM.

3-3. Test Equipment Connection








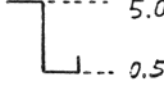




3. ALIGNMENT POINTS



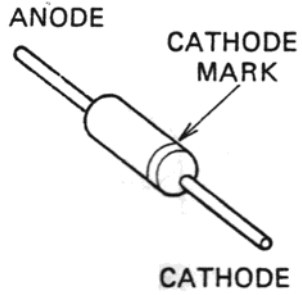
4. IC VOLTAGE CHART

IC No.	IC NAME	IC PIN No	RX (v)		Tx (v)
1	LA 1185	1	1.0		0
		2	1.7		0
		3	6.5		0
		4	1.6		0
		5	0		0
		6	6.2		0
		7	5.8		0
		8	6.5		0
		9	6.6		0
2	TDA 1220B	1	6.5		0.3
		2	1.3		0.3
		3	6.4		0.3
		4	1.3		0.8
		5	1.3		0.7
		6	6.0		0.8
		7	6.6		0.3
		8	0.7		0
		9	2.0		0.2
		10	6.6		0.3
		11	0		0
		12	0		0
		13	0		0
		14	6		0
		15	6		0
		16	0		0
3	M5223L	1	4.0	SD Max 4.0	4.0
		2	4.0	4.0	4.0
		3	4.0	4.0	4.0
		4	0	0	0
		5	1.9	1.2	1.9
		6	1.5	1.5	6.9
		7	6.2	0	0
		8	7.4	7.4	7.4
4	TDA 1905	1	0		6.4
		2	0.3		12.5
		3	0.3		10.9
		4	0		0
		5	0		0
		6	0		2.4
		7	0.1		2.4
		8	0.1		2.4
		9	0		0
		10	0		0
		11	0		0
		12	0		0
		13	0		0
		14	0		0
		15	0		0
		16	0		0

IC No.	IC NAME	IC PIN No.	Rx (v)	Tx (v)
5	SM 5121 - 00 (19 CH.)	1		
		2	0.6	0.6
		3	0.6	0.6
		4		
		5	5.0	5.0
		6		
		7		
		8	0	0
		9	2.6	2.6
		10	2.5	2.5
		11	0	0
		12	2.3	2.3
		13	5.1	5.1
		14	2.5	2.5
		15	2.7	2.7
		16	2.7	2.7
		17	0	0
		18	0	0
		19	0	0
		20	2.7	2.7
		21	0	0
		22		
6	TDA 2822M	1	2.3	0
		2	5.4	0
		3	2.3	0
		4	0	0
		5	0.6	0
		6	0	0
		7	0	0
		8	0.6	0

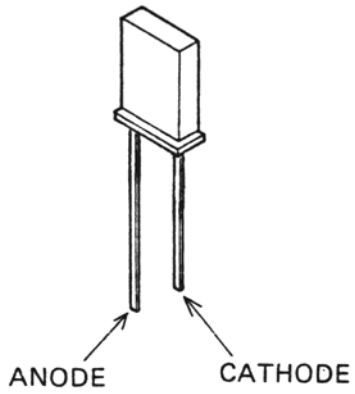
5. SEMICONDUCTOR LEAD IDENTIFICATION

DIODE

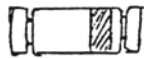


1N60P
1S2339G
MC-301
1N4003
1S1555

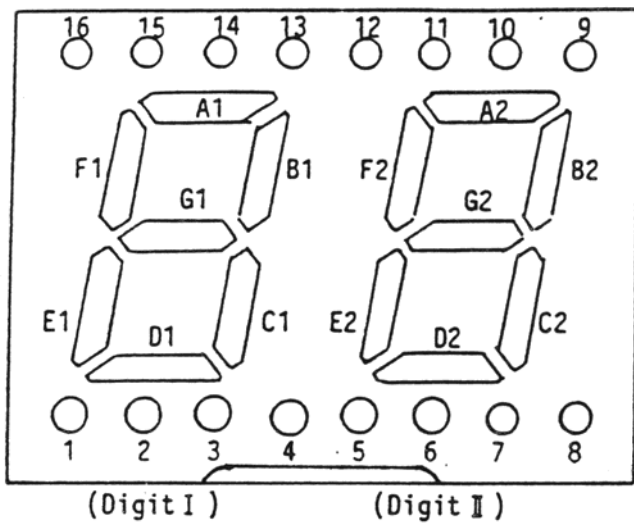
HZ5C-1
HZ3B3
HZ-5C3
HZ-6C1
HZ-9A1



RT-242



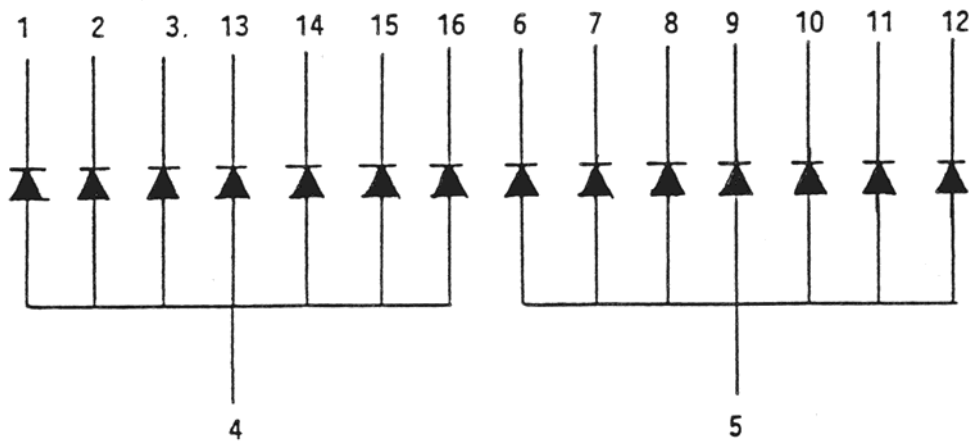
DLS1585



UG-203

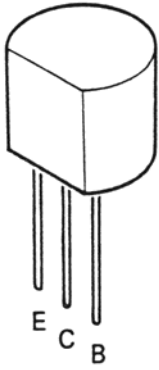
PIN NO.

- | | | | |
|----|-----------------|-----|----|
| 1. | C1 | 9. | G2 |
| 2. | E1 | 10. | A2 |
| 3. | D1 | 11. | F2 |
| 4. | Common Digit I | 12. | B2 |
| 5. | Common Digit II | 13. | B1 |
| 6. | D2 | 14. | F1 |
| 7. | E2 | 15. | A1 |
| 8. | C2 | 16. | G1 |

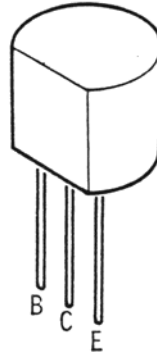


TRANSISTOR

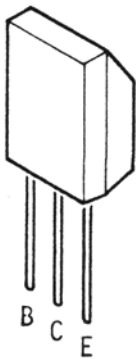
**NOTE: B: Base
C: Collector
E: Emitter**



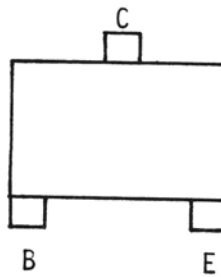
2SC941
2SC3242A-E



2SB525
2SC2086



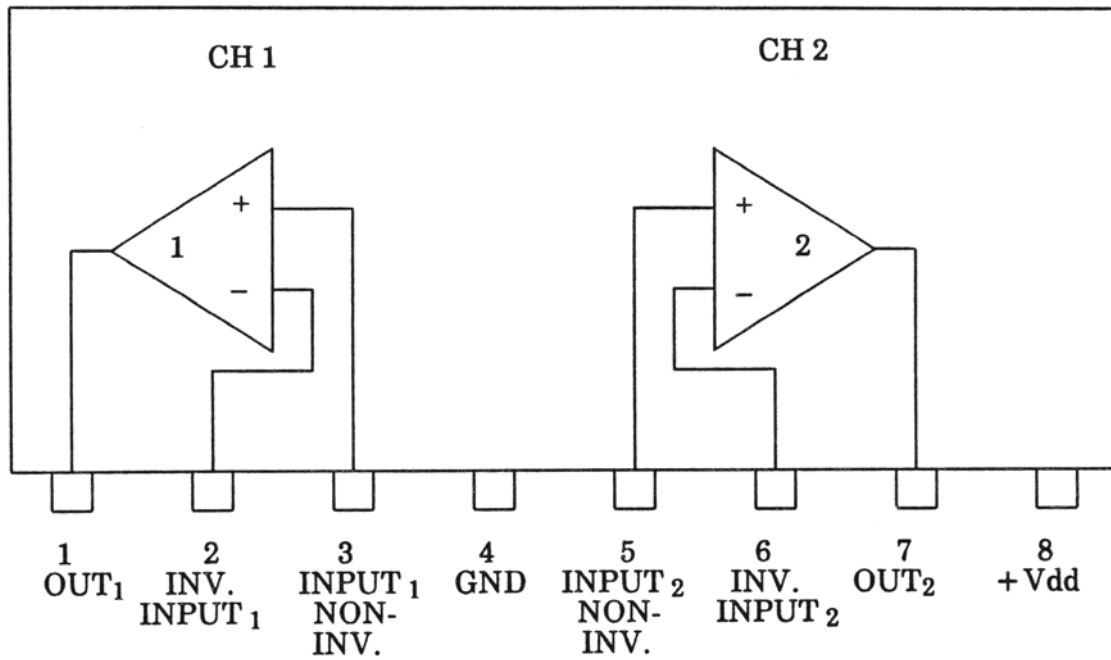
2SB753
2SC2166



2SA1179-M6
2SD3242A-E
2SC2812-L5
2SC2814-F5

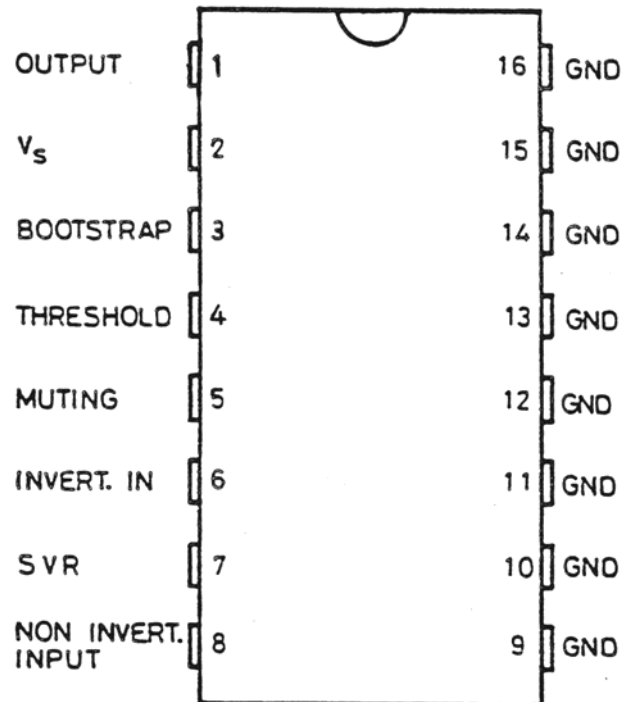
M5223L

(Squelch and AGC Amplifier)

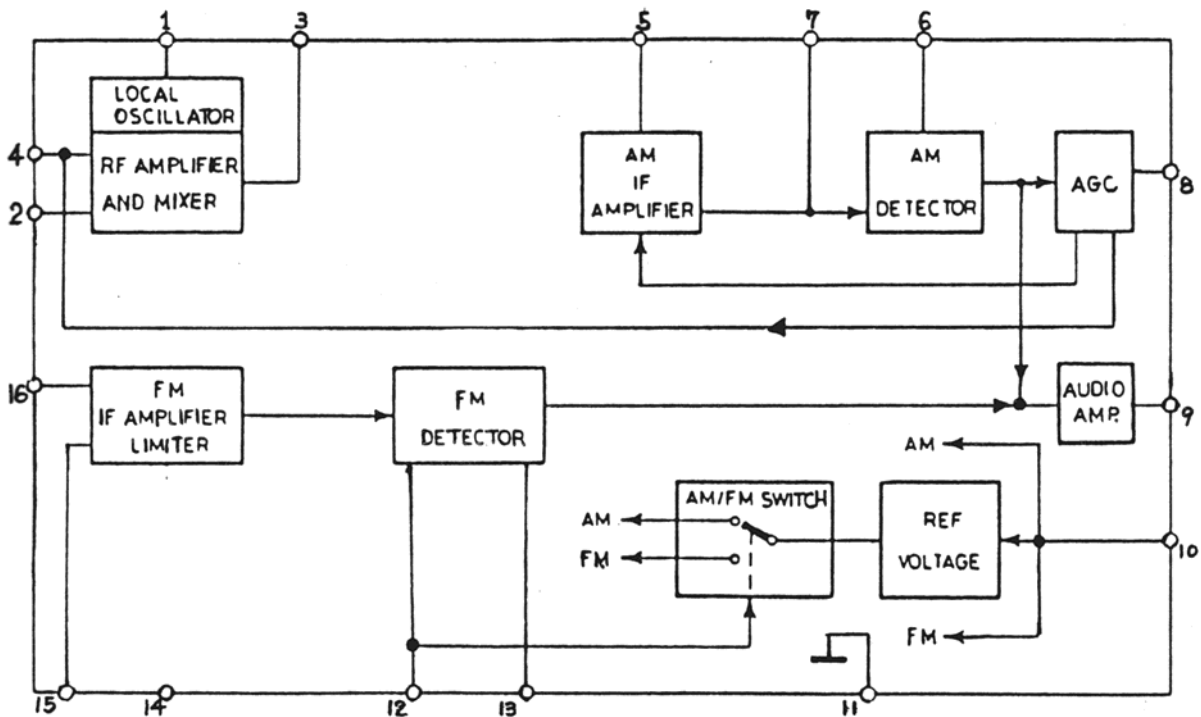
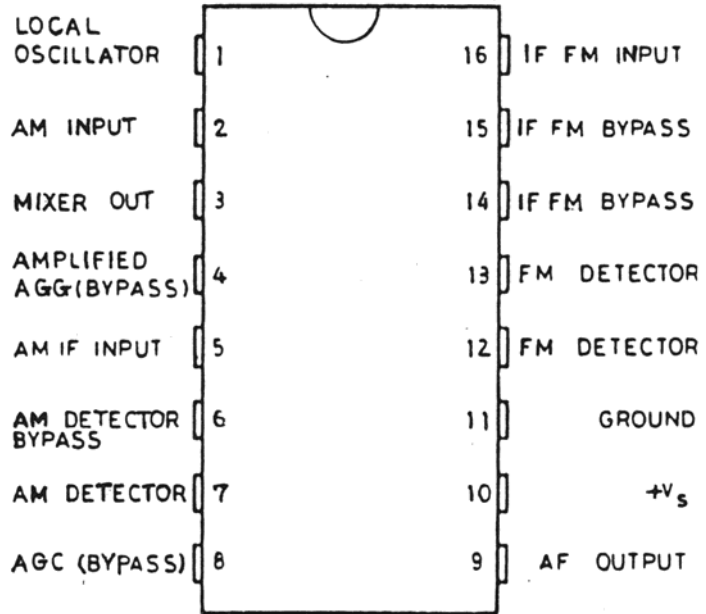


TDA1905

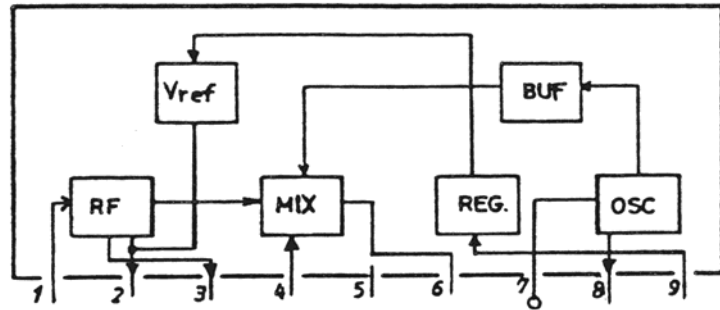
(Audio Amplifier)



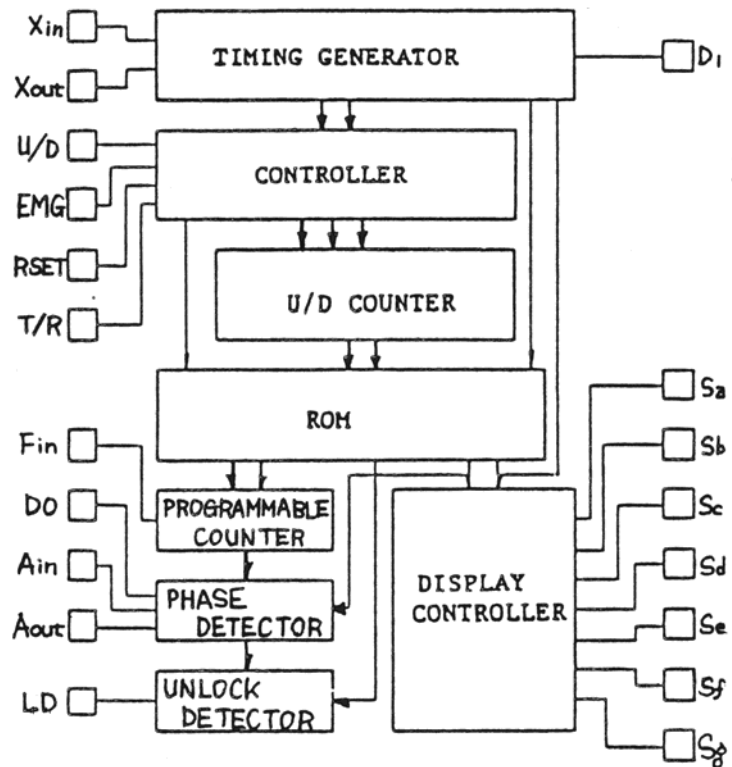
TDA1220B
(IF Mix)



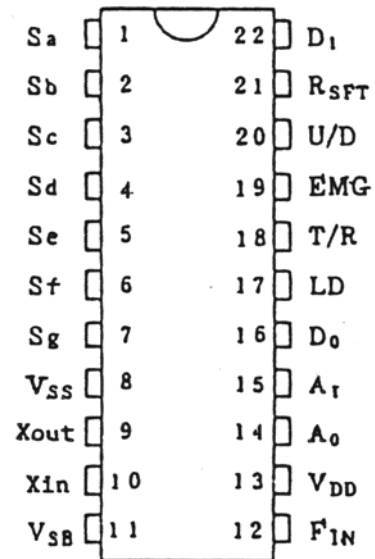
LA-1185



SM5121-00



SM5121-00



Pin No.	PIN NAME	Function
1 through 7	Sa through Sg	Display Segment Driver
8	V _{SS}	Ground
9, 10	Xout, Xin	Crystal Oscillation Circuit; 10.24MHz
11	V _{SB}	Channel Memory Back Up; V _{SS} level
12	F _{IN}	Input of Programmable Divider
13	V _{DD}	Power Supply Pin; +5.8V
14	A _O	Amplifier Output for LPF
15	A _I	Amplifier Input for LPF
16	D ₀	Output of Phase Comparator
17	LD	PLL Lock Detector, "L";Unlock
18	T/R	"H";Transmitter, "L";Receiver
19	EMG	Emergency Channel Call, "H";ON
20	U/D	Channel Up/Down Switch "H";Up, "L";Down, "Open";No Operation
21	R _{sft}	Receiving Code Shift, "H";N+1
22	D ₁	Display Digit Controll

TDA 2822M

(Dual Low-voltage
Power Amplifier)

