

# INSTRUCTION MANUAL FT-101ZD

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel: 01844-351694 Fax: 01844-352554
Email: enquiries@mauritron.co.uk

YARSU MUSEN CO., LTD.

TOKYO JAPAN

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# HIGH—PERFORMANCE HF TRANSCEIVER YAESU FT-101ZD



#### GENERAL DESCRIPTION

The FT-101ZD is a precision engineered, high-performance HF transceiver of advanced design, providing all band (160 - 10 meters) operation on SSB, CW, and AM. This transceiver operates at an input power of 180 watts.

Advanced features include digital plus analog frequency display, continuously variable IF bandwidth (300 Hz - 2.4 kHz), a superb noise blanker with threshold adjustment, and an effective RF speech processor. The receiver boasts excellent dynamic range, despite its high sensitivity, for reliable operation in the presence of strong signals.

Built into every FT-101ZD are VOX, semi-break-in CW with sidetone, a 25 kHz crystal calibrator, selectable AGC, and a 10 dB/20 dB RF attenuator in the incoming signal path.

The FT-101ZD has been engineered for use. Controls and switches are laid out in an efficient and logical manner, so you won't have to fumble for a switch or knob when you need it quickly. And Yaesu designers have now made it possible for you to switch sidebands without recalibrating the display.

All circuits, except the transmitter driver and final amplifier stages, are solid state. Solid state devices provide extremely high reliability and high component density, along with low power drain. The FT-101ZD may be operated from a variety of AC voltages, from 100 to 234 volts. A DC-DC converter, providing operation from a 13.5 VDC power source, is an available option.

For the economy FT-101Z, the counter unit is an available option, providing digital display capability should you want to upgrade your transceiver at a later date. Optional equipment on both models FT-101ZD and FT-101Z are the cooling fan, DC-DC converter, 600 Hz CW filter, and microphone.

A diecast front panel, and the heavy-duty case, provide maximum protection for your transceiver. If the ratings of this unit are not exceeded, it will provide the owner with many years of satisfying operation. Please read this manual carefully before commencing operation, in order to derive maximum satisfaction from your new YAESU transceiver.

# **SPECIFICATIONS**

Frequency coverage:

•	
160 m	1.8 - 2.0 MHz
80 m	3.5 - 4.0 MHz
40 m	7.0 - 7.5 MHz
30 m	10.0 - 10.5 MH
20 m	14.0 - 14.5 MHz
17 m	18.0 - 18.5 MHz
15 m	21.0 - 21.5 MHz
12 m	24.5 - 25.0 MHz
10 m	28.0 - 29.9 MHz

Power requirements:

AC 100/110/117/200/220/234 volts, 50/60 Hz DC 13.5 volts ± 10% (DC-DC converter optional)

Power consumption:

AC 85 VA receive
(73 VA HEATER OFF)
330 VA transmit
DC 5.5 amps receive
(1.1 amps HEATER OFF)
21 amps transmit

Size:

345 (W) x 157 (H) x 326 (D) mm

Weight:

Approx. 15 kg.

TRANSMITTER

Emission type: LSB, USB, CW, AM

Power input:

180 watts DC (SSB, CW) 50 watts DC (AM)

Carrier suppression:

Better than 40 dB

Unwanted sideband suppression: Better than 40 dB (14 MHz, 1 kHz)

Spurious radiation:

Better than 40 dB down

Transmitter frequency response: 300 - 2700 Hz (-6 dB)

Third order distortion products:

Better than 31 dB down

Transmitter frequency stability:

Less than 300 Hz after 10 minute warmup; less than 100 Hz after 30 minute warmup.

Antenna output impedance:

50 - 75 ohms, unbalanced

Microphone input impedance:

500 - 600 ohms (low impedance)

RECEIVER

Sensitivity:

 $0.25 \,\mu\text{V}$  for S/N 10 dB (SSB, CW)  $0.5 \,\mu\text{V}$  for S/N 10 dB (AM)

Image rejection:

Better than 60 dB (160 - 12 m) Better than 50 dB (10 m)

IF rejection:

Better than 70 dB (160, 80, 20-10 m) Better than 60 dB (40 m, 30 m)

Selectivity:

SSB, AM 2.4 kHz at 6 dB down, 4.0 kHz at 60 dB down CW (with optional CW filter) 600 Hz at 6 dB down, 1.2 kHz at 60 dB down

Bandwidth control:

Continuous from 2.4 kHz to 300 Hz

Audio output impedance:

4 - 16 ohms

Audio output:

3 watts at 10% THD, 4 ohm load

Specifications subject to change without notice.

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Oxon OX9 4QY
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Email:- enquiries@mauritron.co.uk

# TUBES AND SEMICONDUCTORS

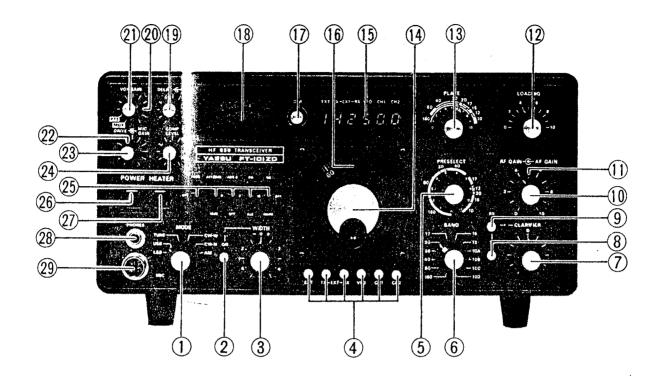
Vacuum Tubes		Integrated Circuits (	IC)	Zener Diodes
12BY7A	1	μPA54H	1	WZ061 1
6146B	2	μPC7505H	1	WZ090 2
		μPC78L12	1	
Transistors		μPC14308	1	Varactor Diodes
T20A6	2	μPC2002H	1	1S2209 1
2SA495	1	MC3403P	1	1S2236 1
2SA496Y	2	MC14024B	1 -	FC63 1
2SA564A	3	MSM9520RS	1	:
2SA639	1	NJM78L05	1	Light Emitting Diodes
2SA733	1	SN76514N	1	GD4-203SRD 9
2SA952LB	14	SN74LS123N	1	
2SB616	1	TA7060P	1	LED Display
2SC372Y	15	TA7063P	1	HP-5082-7623 6
2SC373	1			
2SC380TMY	15	Germanium Diodes		
2SC535A	1	1N60	11	
2SC732TMGI	R 1	1S1007 (GB)	12	
2SC1000GR	2	` ,		,
2SC1383	1	Silicon Diodes		
2SC1583	2	1S1555	65	
2SC1674	1	10D1	7	
2SC1815GR	1	10D10	8	
2SC1815Y	6	V06B	2	.•
2SC2407	2	1SS53	25	•
MPSA13	1			•
Field Effect Transis	stors	Schottky Barrier Di	ode	
2SK19GR	8	ND487C2-3R	1	
2SK19BL	1	(Ring Module)		
3SK40M	1			
3SK 51-03	7			
3SK73	1		·	
J310	2	,	•	

# FT-101ZD SERIES MODEL CHART

O = BUILT-IN FEATURE X = AVAILABLE OPTION

FEATURE	FT-101ZD	FT-101Z
ALL BAND CRYSTALS	0	0
COUNTER UNIT	0	X
DC-DC CONVERTER	X	X
CW FILTER	X	X
MICROPHONE	X	X
RF PROCESSOR	0	0
COOLING FAN	X	X

#### **CONTROLS AND SWITCHES**



#### (1) MODE

Selection of LSB, USB, CW-W (SSB filter), CW-N (optional CW filter) and AM is provided.

#### (2) WIDTH ON

When this button is pressed, the variable bandwidth function is activated.

#### (3) WIDTH

This control varies the IF bandwidth from 2.4 kHz down to 300 Hz. When the WIDTH switch is OFF, the bandwidth is fixed by the filter selected at the MODE switch.

#### (4) SELECT switches

When using the optional FV-901DM synthesized, scanning external VFO, these switches determine which component will control the transmit, receive, or transceive frequency.

EXT..... This switch, when pressed, shifts control of the transceive frequency to the external VFO.

TX EXT... This switch, when pressed, shifts control of the transmit frequency to the external VFO.

RX EXT... This switch, when pressed, shifts control of the receive frequency to the external VFO.

VFO..... This switch selects control of the transceive frequency on the FT-101ZD internal VFO.

CH1, CH2. These switches select optional fixed channels, transceive only.

#### (5) PRESELECT

The preselector control peaks the RF and IF stages for the frequency in use.

#### (6) BAND

The bandswitch selects the frequency band in use: § 160 - 10 meters.

#### (7) CLARIFIER

The clarifier control allows offset of ±2.5 kHz from the frequency established by the main tuning dial.

#### (8) (9) CLARIFIER SELECT switches

Press the RX button for offset of the receive frequency.

Press the TX button for offset of the transmit frequency.

Press both buttons for offset of the transceive frequency.

#### (10) AF GAIN

The AF GAIN control varies the output level of the audio amplifier stages. Cockwise rotation increases the audio output level.

#### (11) RF GAIN

The RF GAIN control varies the gain of the RF and IF stages. Clockwise rotation increases the gain of these stages.

#### (12) LOADING

This control tunes the output circuit of the final amplifier pi network to match the feedpoint impedance of the load.

#### (13) PLATE

This control tunes the plate circuit of the final amplifier.

#### (14) MAIN TUNING KNOB

Rotation of this knob selects the operating frequency, in conjunction with the setting of the bandswitch. One revolution of the dial produces a frequency change of approximately 17 kHz.

#### (15) DIGITAL DISPLAY

The digital display reads out the operating frequency, with resolution to 100 Hz. The display unit is built into the FT-101ZD, and is an available option for the FT-101Z.

#### (16) ANALOG DIAL

The analog dial allows readout of the operating frequency to better than 1 kHz. The combination of the precision dial mechanism and drive unit provides zero backlash at slow tuning rates.

#### (17) DIM

This control allows dimming of the meter and dial lamps.

#### (18) **METER**

The meter displays final amplifier cathode current (IC), relative power output (PO), and ALC feedback voltage.

#### (19) NB

This control varies the threshold point for the noise blanker, and should be set to the minimum point that provides the desired blanking action.

#### (20) **DELAY**

This control sets the delay time for the VOX relay. For voice-actuated SSB, or semi-break-in CW, the operator may select the delay time most suitable for his or her operating habits.

#### (21) VOX GAIN

The threshold level for the VOX (voice operated relay) system can be varied using this control. In the PTT position, PTT (push to talk) control is provided, for relay control via the microphone PTT switch or footswitch.

#### (22) DRIVE

This control sets the carrier level for CW/AM and tuning purposes. When the RF processor is ON, this control varies the RF output on SSB, as well.

#### (23) MIC GAIN

This control sets the output level of the microphone amplifier stage. Clockwise rotation increases the mic gain level.

#### (24) COMP LEVEL

This control varies the compression level for the built-in RF speech processor. The processor does not function in the AM mode.

#### (25) FUNCTION switches

PROC ...... This switch activates the RF speech processor.

ATT......... This switch allows the insertion of 10 or 20 dB attenuators in the incoming signal path.

AGC S/F/OFF.. This switch allows selection of the desired AGC decay time. In the OFF position, the AGC is switched off, and the S-meter will not function.

PO/IC/ALC .... In the PO position, relative power output is displayed on the meter. In the IC position, final amplifier cathode current is displayed. In the ALC position, ALC voltage is displayed. Regardless of the setting of the meter switch, the meter functions as an S-meter on receive.

NB/MARK.... In the NB position, the noise blanker is activated. In the MARK position, the internal crystal calibrator is activated.

# (26) POWER

This is the main ON/OFF switch for the transceiver.

## (27) HEATER

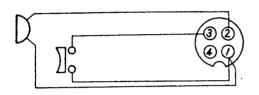
With the HEATER switch on, heater voltage is applied to the driver and final amplifier tubes. This switch may be turned off during periods of RX, when energy conservation is critical.

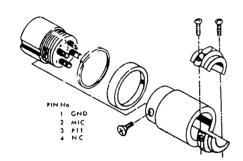
#### (28) PHONES

This is a standard 1/4" phone jack for use with headphones.

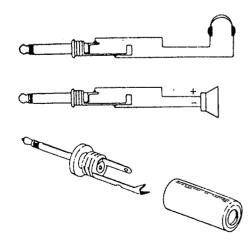
#### (29) MIC

This is a 4 conductor jack for microphone and PTT input.

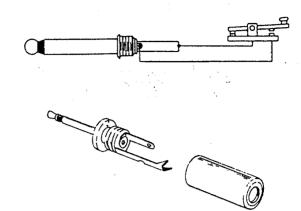




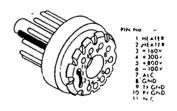
Mic plug



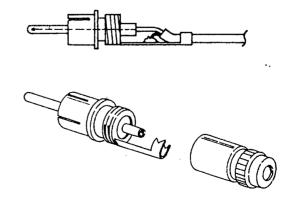
Headphone and external speaker plug



Key plug



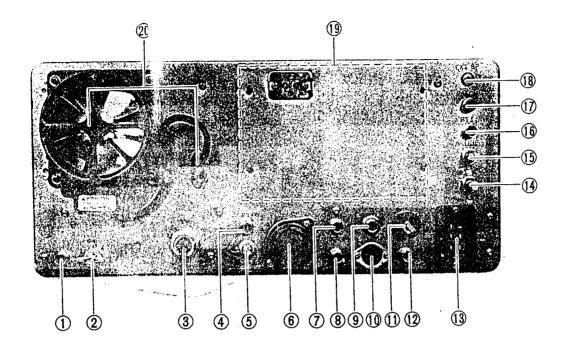
ACC plug



Pin plug

#### REAR APRON

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8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel: 01844-351694 Fax:- 01844-352554
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#### (1) RF OUT

RF output of 3 volts RMS is available at this jack for use with a transverter. Output is from the driver stage.

#### (2) GND

For best transceiver performance, as well as protection from electrical shock, a good ground connection should be made at this point, using a heavy, braided wire of the shortest length possible.

#### (3) ANT

Standard "UHF" connector for the antenna.

#### (4) RCV ANT

This jack is switched in parallel with the ANT jack on receive, for use with an external receiver.

#### (5) PO ADJ

This control adjusts the relative power output meter.

#### (6) ACC

Transceiver operating voltages and relay connections can be accessed through the accessory jack. Please insert the ACC plug at all times, to provide heater voltage for the driver and final amplifier tubes.

#### (7) TONE OUT

The CW sidetone may be fed to an external receiver through this jack.

#### (8) A TRIP IN

Anti-trip input from an external receiver may be made via this jack, to prevent the receiver audio output from tripping the FT-101ZD VOX.

#### (9) KEY.

The CW key may be connected at this point. Key-up, voltage is 7 volts, and key-down current is 1.5 mA. Be sure your electronic keyer's output switch will handle these levels.

#### (10) EXT VFO

Connection of an external VFO, such as the FV-101Z or FV-901DM, can be made at this jack.

#### (11) FUSE

This is the fuse holder. For 100 - 117 volts, replace with only a 5 amp use. For 200 - 234 volts, use a 3 amp fuse. Replace fuses only with a fuse of the proper rating.

#### (12) IF OUT

Wideband IF output is available at this jack for use with a spectrum analyzer, etc.

#### (13) POWER

Connect the AC power cord at this point, being certain that your AC supply oltage matches the voltage specification for your transceiver. See the transformer primary connectice chart. When using the optional DC-DC converte, the DC supply is connected at this point. DO NOT CONNECT THE AC POWER CORD TO A DC POWER SOURCE. OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY SUCH IMPROPER POWER CONNECTIONS.

#### (14) TONE

This control varies the CW sidetone output level.

#### (15) A TRIP

This control varies the level of the VOX anti-trip circuit.

#### (16) PTT

External control of the transceiver PTT (push to talk) system may be made at this jack, for use with a footswitch, etc.

#### (17) PATCH

Microphone or phone patch input may be made at this jack. Impedance is 500 ohms.

#### (18) EXT SP

This is a miniature phone jack for speaker output. When a plug is inserted into this jack, the transceiver internal speaker will be cut off. Impedance is 4-16 ohms.

# (19) DC-DC CONVERTER (OPTION)

The optional DC-DC converter allows operation from a 13.5 volt DC power source.

#### (20) COOLING FAN (OPTION)

The optional cooling fan keeps the tubes at a safe operating temperature, when they are used in a hot environment. The 2 pin fan power jack supplies 100 volts to the fan.

#### **ACCESSORIES**

The following accessories are included with your new transceiver:

#### (1) AC POWER CORD

1

The power cord comes equipped with a 6-prong connector for connection to the AC supply.

#### (2) ACC PLUG

1

The accessory plug allows access to relay contacts and transceiver operating voltages. The ACC plug must be inserted in the accessory socket for proper operation of the transceiver, whether or not external connections are being made.

#### (3) PHONO PLUG

2

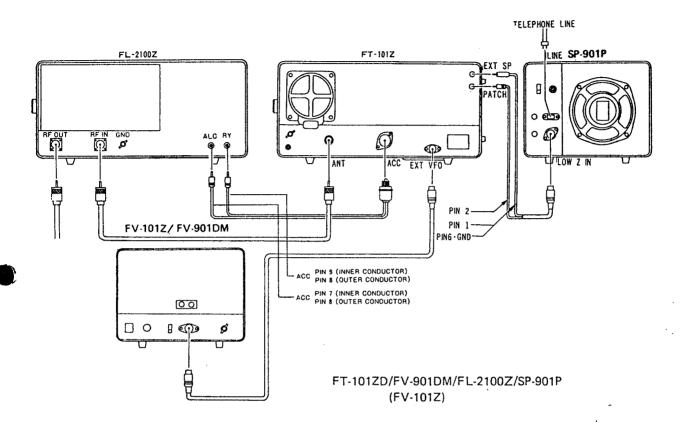
Use these plugs for interface with station equipment via the FT-101ZD rear panel.

#### (4) SPARE FUSES 5A (3A)

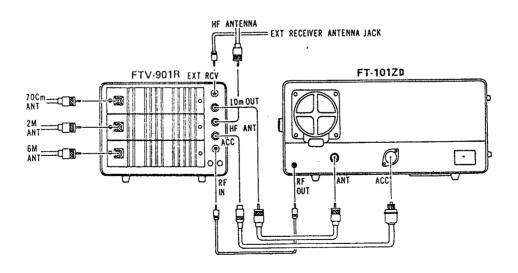
1 each

When replacing fuses, be absolutely certain to use a fuse of the proper rating. OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY IMPROPER FUSE REPLACEMENT. For 100-117 volt AC operation, use a 5 amp fuse. For 200-234 volt operation, use a 3 amp fuse.

# INTERCONNECTIONS



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FT-101ZD/FTV-901R

#### INSTALLATION

The FT-101ZD is designed o be a single-unit station for fixed or portable operation from AC power. Power supply connections providing for operation from a variety of source voltages are available. Please read the following sections carefully, so as to ensure proper installation of your new transceiver.

#### PRELIMINARY INSPECTION

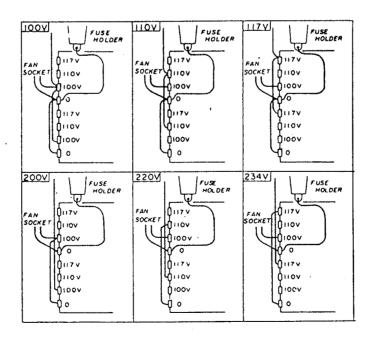
Upon opening the packing carton, immediately give the transceiver a thorough visual inspection. Check to see that all controls and switches are working freely, and inspect the cabinet for any signs of damage. If any damage has been sustained, immediately contact the shipping company, and document the damage completely. Save the packing carton and foam packing material for possible use at a later date.

#### BASE STATION INSTALLATION

The FT-101ZD is designed for use in many areas of the world, using supply voltages that may differ from your local supply voltage. For this reason, be absolutely certain that the voltage specification marked on the rear of the transceiver agrees with the local AC supply voltage. THIS INSPECTION MUST BE MADE BEFORE CONNECTING THE AC POWER CORD TO THE REAR APRON OF THE TRANSCEIVER.

#### **CAUTION**

PERMANENT DAMAGE WILL RESULT IF IMPROPER AC SUPPLY VOLTAGE IS APPLIED TO THE TRANSCEIVER. OUR WARRANTY DOES NOT COVER' DAMAGE CAUSED BY APPLICATION OF IMPROPER SUPPLY VOLTAGE. DO NOT CONNECT THE AC POWER CORD TO A DC POWER SOURCE.



The transceiver should be cornected to a good earth ground. The ground lead sould be made of a heavy, braided wire, and should be connected to the GND terminal on the sar apron of the transceiver.

#### MOBILE INSTALLATION

(Note: The DC-DC converter coscribed herein is optional equipment. See your Yaesu dealer.)

When the optional DC-DC converter is installed, the FT-101ZD will operate satisfactorily from a 13.5 volt DC power source capable of providing the required current. The DC power cord is included with the DC-DC converter kit.

For under-dash mobile mounting, a special mobile mounting bracket is an available option for your transceiver. The FT-101ZD should be located away from heater ducts, and a minimum of two inches of air space on all sides is recommended, to allow proper air flow around the cabinet. Never stack other units above or below the FT-101ZD, as the accumulated heat from both units could cause damage.

The transceiver requires an average of 14 amps on transmit, with 20 amps on voice peaks. The DC power cable comes equipped with a 20 amp fuse. Be certain to use only a 20 amp fuse when making replacement.

When making battery connections, be absolutely certain that the RED lead is connected to the POSITIVE battery terminal, and the BLACK lead is connected to the NEGATIVE battery terminal. Reversed connections could cause permanent damage to the transceiver. OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY IMPROPER SUPPLY CONNECTIONS.

It is recommended that the power connections be made directly to the battery, instead of to the ignition switch, etc. The battery provides considerable filtering action against ignition noise, and connection to the ignition switch can place the power line in a noisy circuit. Keep the power lead as short as possible, and keep the lead away from ignition cables.

Before connecting the DC power cable to the transceiver, check the battery voltage with the engine running (battery charging). If the voltage exceeds 15 volts DC, the vehicle voltage regulator should be adjusted, so as to limit the highest charging rate to less than 15 volts. As well, do not operate the transceiver if the DC supply voltage is less than 12 volts. The transceiver should always be turned off when the car is started, to prevent voltage transients from damaging the power supply components.

# ANTENNA CONSIDERATIONS

The FT-101ZD is designed for use with an antenna system presenting a 50 - 75 ohm resistive load at the antenna jack. While the transmitter output circuitry is designed for uniform response within this impedance range, significant departures from the 50 - 75 ohm specification will result in seriously degraded transceiver performance, and may result in damage to the final amplifier tubes.

If an open-wire feedline is used, or if the input impedance of the antenna system presents a higher or lower impedance than specified, some sort of antenna tuner must be used to provide the proper impedance for the transceiver. See your Yaesu dealer for details of the FC-902 antenna coupler.

For mobile operation, most of the commercially-available antennas will provide satisfactory results, if care is taken to tune the antenna for minimum SWR. The outer conductor of the coaxial cable should be securely grounded to the automobile chassis at the antenna mount. See your Yaesu dealer for details on the RSL series of mobile antennas.

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8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
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#### **OPERATION**

The tuning procedure for this ransceiver is not complicated. However, care should be exercised when tuning so that peak pe formance of the equipment is secured. The following paragraphs describe the procedure for receiver and transmitter tuning.

#### INITIAL CHECK

Before connecting the transceiver to the power source, be certain that the voltage specification marked on the rear of the transceiver matches your local supply voltage, and also confirm that a fuse of the proper rating is being used.

#### FREQUENCY SELECTION

Frequency readout on the FT-101ZD is by digital as well as analog displays. The FT-101Z uses analog display only. The analog readout dial provides resolution to 1 kHz, while the FT-101ZD digital display provides resolution to 100 Hz. The digital display may be added to the FT-101Z as an option. See your Yaesu dealer for details.

#### RECEIVE OPERATION

(1) Preset the controls and switches as follows:

POWER .... OFF

HEATER . . . OFF

VFO..... Switch pushed

VOX GAIN .. PTT position

RF GAIN . . . . Fully clockwise

AF GAIN ... Adjust later for comfortable

level

BAND ..... Desired band

MODE . . . . . Desired mode

PRESELECT . Desired band segment

AGC.....OFF

ATT....OFF

MARK/NB...OFF

(2) Turn the power switch to ON. The meter will light up, and the operating frequency will be displayed on the dial window (FT-101ZD). Adjust the AF GAIN control for a comfortable listening level, and adjust the PRE-SELECT control for maximum receiver noise or signal level. The PRESELECT control may require repeaking as the transceiver is tuned across the band.

- (3) The RX CLARIFIER may be utilized if the received signal is drifting. Push the RX button, and rotate the CLARIFIER control for offset of up to 2.5 kHz. A red LED indicator will light up when the clarifier is in use.
- (4) When pulse-type noise is encountered, the NB (Noise Blanker) switch should be activated. Advance the noise blanker level control (located on the front panel) to the point which provides the desired blanking. Do not advance the level control beyond the point required to eliminate the noise pulses.
- (5) For varying the width of the IF passband, press the WIDTH button, and rotate the WIDTH control. In the IF, two 8-pole crystal filters are used. One filter is fixed, and presents a boundary for the bandwidth. The center frequency is then varied across the passband of the second filter, using a mixing scheme that provides no change of pitch in the received signal.

The result is continuously variable bandwidth, from 2.4 kHz down to approximately 300 Hz. When the WIDTH switch is turned OFF, the second IF filter is instantly aligned with the first filter, returning the receiver to a 2.4 kHz bandwidth.

(6) For extremely strong signals, the ATT (attenuator) switch may be activated, providing 10 dB or 20 dB of attenuation on the incoming signal path, depending on the position of the ATT switch.

#### TRANSMITTER TUNING

The following tuning procedure must be performed prior to commencing operation on the desired mode. See the paragraphs relating to the specific mode after basic transmitter tune-up has been accomplished.

Be certain that a dummy load or matched antenna is connected to the antenna receptacle on the rear apron of the transceiver. It is possible to damage the final amplifier components of this equipment if this simple precaution is not followed prior to commencing transmission.

Do not exceed 10 seconds of key-down time while tuning.

As well, be certain that the ACC plug is inserted into the rear apron ACC jack. Without this plug, there will be no power applied to the tube heaters. Heater voltage is applied through pins 1 and 2 of the accessory socket.

(1) Preset the controls and switches as follows:

MODE ..... TUNE

DRIVE ..... Fully counterclockwise

DELAY ..... Fully counterclockwise

MIC GAIN..... Fully counterclockwise

COMP LEVEL ... Fully counterclockwise

HEATER ..... ON

PROC .....OFF

PO/IC/ALC ..... IC

PLATE ..... Set to desired band seg-

ment

LOADING .....0

PRESELECT ..... Peaked on receive for

maximum response

TX CLARIFIER .. OFF (button not pushed)

- (2) Turn the HEATER switch ON, and wait 1 minute for the tube heaters to warm up.
- (3) Set the VOX GAIN switch to the MOX position. Observe the reading on the IC meter: it should read 50 mA with no drive applied. If it is not, adjust the PB-1968 BIAS control for a resting current of 50 mA on the IC meter. Refer to the BIAS Adjustment on Page 37. Be certain that the DRIVE control is fully counterclockwise for this adjustment.
- (4) Set the VOX GAIN switch to MOX. Advance the DRIVE control for a reading of 150 mA.
- (5) Peak the PRESELECT control for a maximum meter reading. If the meter reading exceeds 150 mA, reduce the setting of the DRIVE control.
- (6) Rotate the PLATE control for a minimum reading ("dip") on the IC meter. Return the transceiver to the receive mode by rotating the VOX GAIN switch out of the MOX position.

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Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
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### LOADING POSITIONS

BAND	FREQUENCY	POSITION
	1.8MHz	2.5
160 m	2.0MHz	6.0
	3.5MHz	3.0
80 m	4.0MHz	6.0
	7.0MHz	6.0
40 m	7.5MHz	6.5
	10.0MHz	7.0
30 m	10.5MHz	8.0
	14.0MHz	3.0
20 m	14.5MHz	4.0
	: 18.0MHz	2.0
17 m	18.5MHz	2.0
	21.0MHz	2.0
15 m	21.5MHz	2.5
	24.5MHz	3.0
12 m	25.0MHz	3.0
10m A	28.0MHz	2.0
10 m B	28.5MHz	2.0
10 m C	29.0MHz	2.0
10m D	29.5MHz	2.0

NOTE: LOADING positions are nominal. Minor variations from positions shown are to be expected.

#### FINAL TUNING

Final transmitter tuning uses the relative power output setting of the METER switch. At full rated output, using a 50 ohm load, the PO meter will indicate between 1/2 and 2/3 of full scale deflection. If the PO reading is too high (off scale) or too low (1/4 scale or less), and if the load impedance is very close to 50 ohms, the PO ADJ control on the rear apron may be varied to provide the proper deflection. Once the PO meter is calibrated, off-scale deflections are the result of reflected power (high SWR), and corrective action may be required in the antenna system.

Set the controls as follows for final tuning:

- (1) Set the METER switch to PO. Rotate the DRIVE control to the 9 o'clock position.
- (2) Rotate the VOX GAIN control to the MOX position, and rotate the PRESELECT control for a maximum meter reading.
- (3) Rotate the LOADING control for a maximum meter reading. Rotate the PLATE control for a maximum meter reading.
- (4) Again rotate the LOADING control and PLATE control, each time advancing the

DRIVE control approxir ately 2 steps, until the DRIVE control is fully clockwise. The transmitter is now tuned or maximum power output. Do not exceed the maximum tuning time stipulated previously. Return the VOX GAIN switch to the VOX position (out of the MOX position), return the METER switch to IC, and return the DRIVE control to the fully counterclockwise position.

#### SSB OPERATION

After completing the above tuning procedure, set the MODE switch to USB or LSB as desired. Set the VOX GAIN control to PTT, and activate the transmitter by pushing the microphone PTT switch or the footswitch, if used. With the METER switch set to the ALC position, speak into the microphone in a normal voice. Advance the MIC GAIN control until the meter kicks up to the midscale of the green-colored portion of the meter scale.

Note: When the METER switch is set to IC, voice modulation peaks will indicate 150 - 200 mA. Actual peak current, though, is approximately 2 times the indicated value.

To set the sensitivity of the VOX (voice-operated T/R switching) system, advance the VOX GAIN control slowly while speaking into the microphone. Advance the VOX GAIN control to the point where the speech signal activates the transmitter.

Set the antitrip potentiometer on the rear apron to the minimum point which prevents the speaker output from tripping the VOX. Do not use more VOX gain nor antitrip than is necessary. Adjust the front panel DELAY control for the desired relay recovery time.

#### RF SPEECH PROCESSOR ADJUSTMENT

The FT-101ZD RF speech processor, when correctly adjusted, will improve the intelligibility threshold at the receiving end; by increasing the average SSB power output. RF clipping is applied to the IF signal, which is then filtered to remove harmonics and out of band intermodulation products. RF envelope clipping causes much less distortion than that caused by an equivalent amount of AF clipping, and the result is an output signal with more "punch".

Set the PROC switch to OFF, and set the MIC GAIN control as described previously (voice peaks falling within the green zone of the ALC meter scale). Now set the PROC switch to ON, and set the COMP LEVEL control to the 10 o'clock position. Advance the DRIVE control so that the desired power output is obtained, and be sure that the ALC meter indication is within the green zone.

With the RF speech processor activated, the ALC meter indication may not be quite as high as when the processor is off. This is entirely normal, because the average power output is higher with the processor, although the peaks are being clipped.

Setting the COMP LEVEL control up to the 3 o'clock position will provide up to 10 dB of compression. Advancing the control beyond the 10 o'clock point may, however, degrade the voice-to-noise ratio, so caution is recommended.

#### CW OPERATION

After completing the tuning procedure, insert the key line into the KEY jack on the rear panel.

The operator may select any power output desired by advancing the DRIVE control. Once the maximum power output level has been reached, the DRIVE control should not be advanced further.

The transmitter may be activated by the VOX circuit, or by the PTT or MOX systems. The TONE (control on the rear apron of the transceiver sets the CW sidetone level.

The key-up voltage at the key jack is 7 volts, and the key-down current is 1.5 mA.

For receiving, two positions of selectivity are provided. When the optional CW filter is installed, the operator may select between the 600 Hz bandwidth of the CW filter and the 2.4 kHz bandwidth of the SSB filter. The WIDTH control may be used with either position of the MODE switch: CW-W or CW-N.

#### AM OPERATION

AM operation of the transmitter is accomplished by setting the MODE switch tethe AM position and inserting the proper amount of carrier with the DRIVE control.

After completing basic transmitter tune-up, place the MODE switch in the AM position. Activate the transmitter, and rotate the DRIVE control until the meter reads 10 (100 mA) in the IC position of the METER switch. While speaking into the microphone in a normal voice, increase the MIC GAIN control until the meter indicates very slight movement with voice peaks. Care must be exercised that the DRIVE control is not advanced too far. Do not exceed .10 (100 mA) meter indication during AM operation or damage to the transmitter final amplifier tubes may result.

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:-01844-351694 Fax:-01844-352554
Email:-enquiries@mauritron.co.uk

#### SELECT SWITCHES,

The SELECT switches allow selection of internal or external VFO frequency control, as well as selection of up to 2 optional crystal-controlled channels.

When the crystal-controlled channels are installed, they may be selected by pressing CH1 or CH2, as desired. See the crystal information elsewhere for full information on crystal requirements.

The external VFO, FV-101Z and FV-901DM, which provide versatile operations with your FT-101ZD, are available from your Yaesu dealer.

Because there is no calibrated dial for the FV-901DM, it can't be used with the analog FT-101Z.

For transceive frequency control on the external VFO, press EXT. For external VFO control of the transmit frequency, with receive frequency control on the FT-101ZD, press TX EXT. For receive frequency control on the external VFO, and transmit frequency control on the FT-101ZD, press RX EXT. For full transceive control on the FT-101ZD, press VFO.

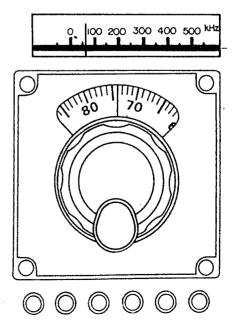
# DIAL CALIBRATION AND FREQUENCY DETERMINATION

The FT-101ZD mixing scheme accounts for the difference in carrier frequencies between USB and LSB. For this reason, no recalibration is required. Once the calibration is properly aligned (at the factory, or in shop), no further adjustment is required for accurate frequency derivation. The 25 kHz calibrator is included largely for alignment purposes, as it provides a useful reference signal for signal peaking, etc.

Frequency readout on the FT-101ZD digital display is straightforward. The full operating frequency is displayed, with resolution to 100 Hz.

The analog display on the FT-101Z and FT-101ZD transceivers provides easy determination of the operating frequency. The frequency displayed on the analog sub dial (and the main display window, for the FT-101Z) is added to the lower band edge frequency.

For example, if the analog dial indicates 074, as shown in the example, and the BAND switch is on 40 meters (lower band edge: 7000 kHz), the operating frequency will be 7074 kHz. By rotating the BAND switch, this position of the analog display will produce 14074 kHz for 20 meters, 21074 for 15 meters, etc. For 80 and 12 meters, the lower band edges are 3500 kHz and 24500 kHz, while for 160 meters the band edge is 1.5 MHz. Therefore, the dial should read 074 to produce 3574 kHz, but 374 for 1874 kHz. Be careful so as not to operate outside the amateur bands.



#### FIXED CHANNEL CRYSTA INFORMATION

Two fixed channels may be used with your FT-101ZD, using optional crustals. Crystals are available from your Yaesu dealer. Crystals must meet the specifications shown in Table 2, and must fall within the operating range 5500 - 5000 kHz. Frequency calculation is made from the formula

$$F_{x} = F_{1} - F_{0}$$

where  $F_X$  is the crystal frequency.  $F_1$  is a constant derived from Table 1  $F_0$  is the operating frequency.

For example, let us say it is desired to operate on 7199 kHz LSB. Referring to Table 1, we see that for 40 meter LSB,  $F_1$  is 12501.5 kHz. Subtracting  $F_0$  (7199 kHz) from  $F_1$  (12501.5 kHz) yields 5302.5 kHz, the crystal frequency ( $F_x$ ).

For operation on 21420 kHz USB, compute the crystal frequency as follows:

 $F_x = 26498.5 - 21420 = 5078.5 \text{ kHz}.$ 

Inspection of the values of  $F_1$  in Table 1 will reveal that the 7199 kHz crystal for LSB will work on 14199 kHz, 21199 kHz, etc. Of course, LSB is not normally used on these bands. If the operator switches to USB, the operating frequency will be moved 3 kHz (in this case, to 14196 kHz, 21196 kHz, etc.). If the move is made from LSB to CW, the frequency will move 2.3 kHz down.

USB	LSB	C W
6998.5	7001.5	6999.2
8998.5	9001.5	8999.2
12498.5	12501.5	12499.2
15498.5	15501.5	15499.2
19498.5	19501.5	19499.2
23498.5	23501.5	23499.2
26498.5	26501.5	26499.2
29998.5	30001.5	29999.2
33498.5	33501.5	33499.2
33998.5	34001.5	33999.2
34498.5	34501.5	34499.2
34998.5	35001.5	34999.2
	6998.5 8998.5 12498.5 15498.5 19498.5 23498.5 26498.5 29998.5 33498.5 33998.5	6998.5     7001.5       8998.5     9001.5       12498.5     12501.5       15498.5     15501.5       19498.5     19501.5       23498.5     23501.5       26498.5     26501.5       29998.5     30001.5       33498.5     33501.5       34498.5     34501.5

Table 1

Туре	HC-25/U
Load Capacitance	, 30pF
Series Resistance	25 Ohms or less
Static Capacitance	7pF or less
Drive Level	5mW

Table 2

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

#### CW FILTER INSTALLATION (OPTION)

- (1) Remove the top cover of the transceiver case, as shown in Fig. 1.
- (2) Refer to Fig. 2, and locate the NB-FIX circuit board. Remove its mounting screws, because this board is obstructing the removal of the IF unit.
- (3) Remove the 12-pin, 13-pin, and 15-pin plugs from their sockets on the IF unit. Remove the IF unit mounting screws, and remove the IF unit from the transceiver case.

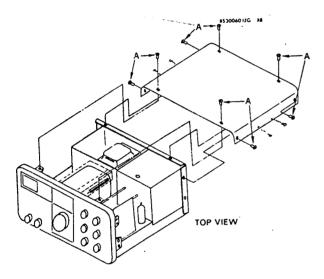


Figure 1

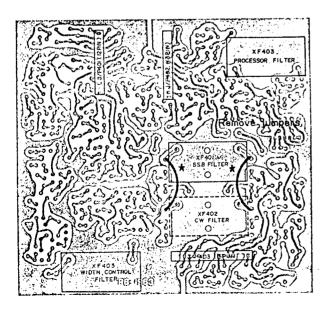


Figure 3

- (4) Install the optional CW filter as shown in the foil side view of the IF unit (Fig. 3). Make the fastening nuts snug, and solder the pins of the filter to the circuit board, and remove the 2 jumper wires shown in Figure 3.
- (5) Re-install the IF unit, being careful to connect the 12-pin, 13-pin, and 15-pin plugs in the correct sockets. Refer to Fig. 2 to be sure. Re-install the NB-FIX unit, and replace the top cover of the transceiver.
- (6) When the optional CW filter is installed, the CW-N position of the mode switch will activate this filter. In the CW-W position, the SSB 2.4 kHz filter will be in use. The WIDTH control is usable in all modes.

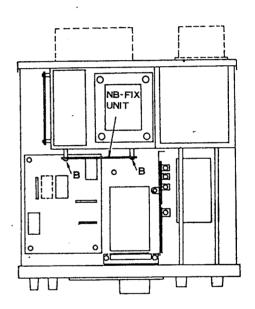


Figure 2

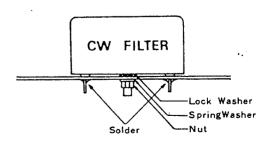


Figure 4

# DC-DC CONVERTER INSTA LATION (OPTION)

The optional DC-DC converte: is easy to install in a matter of minutes. Please fo ow the instructions carefully, in order to make the proper connections.

- (1) Install the DC-DC converter module as shown in the drawing. Use the four screws supplied with the kit. Do not force the plug into the socket, as the connection should be smooth, yet solid.
- (2) Check the DC cable fuse socket, located in the positive (red) lead, to be certain that a 20 amp fuse is installed.
- (3) When making connections to the battery, be absolutely certain that the proper polarity is observed. The RED lead should be connected to the POSITIVE (+) battery terminal, and the BLACK lead should be connected to the NEGATIVE (-) terminal. OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY REVERSED POLARITY CONNECTIONS.
- (4) Before connecting the DC power cable to the transceiver, check the automobile voltage regulator level with the engine running (battery charging). The maximum charging rate

should be 15 volts or less. If the voltage is higher than this level, please adjust the voltage regulator for a maximum of 15 volts. This precaution applies, as well, to bench power supplies, which should be adjusted in the same fashion. Also, the transceiver should not be operated from a supply voltage of less than 12 volts.

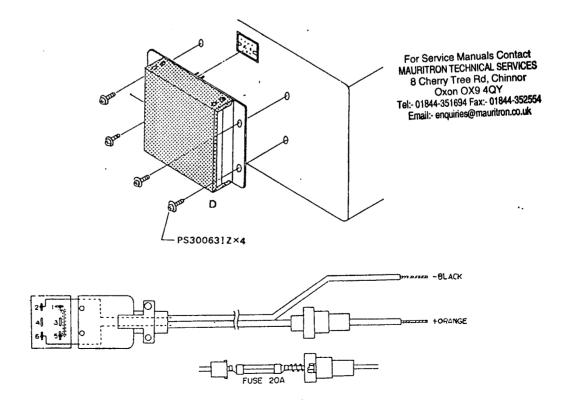
(5) Connect the DC cable to the transceiver. Power connections are made automatically when the DC cable is connected to the POWER jack.

#### NOTES ON MOBILE INSTALLATION

Be certain that sufficient room is provided for free air circulation around the transceiver. If the transceiver must be placed on the car seat, set it on a board or other rigid object, in order to provide the necessary air circulation (and to avoid possible heat damage to the uphoulstery.

A special mobile mounting bracket is available from your YAESU dealer.

The DC supply should be capable of providing 20 amps on voice peaks, 14 amps continuous. The HEATER switch may be turned off during long periods of reception, for energy conservation.

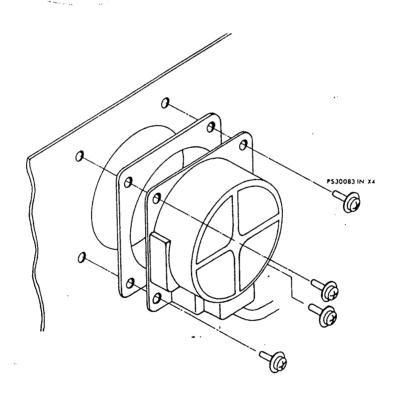


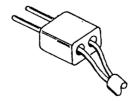
#### COOLING FAN INSTALLAT ON (OPTION)

The FT-101ZD cooling fan may be used with other models of Yaesu equipment. I stallation is easily accomplished in minutes.

Hold the fan up to the rear panel in its proper location. Determine the proper length of the two-wire power lead to the motor. Solder the leads to the 2-pin plug supplied with the fan. The 4-pin plug is not needed for FT-101ZD installation.

Install the fan onto the rear panel of the transceiver, as shown in the drawing. Insert the power lead from the fan into the fan socket on the rear panel.





Fan. plug

#### COUNTER UNIT INSTALLATION ON FT-101Z

This section will deal with the installation of the COUNTER UNIT and digital display, which are optional equipment for the economy FT-101Z model.

#### PARTS NEEDED

Optical Filter with double-face tape	(1)
Counter Module	(1)
Guide Pins	(2)
Support Tower	(1)
Vinyl Tubes	(2)

- (1) Remove the top cover of the transceiver, according to the drawing on page 17.
- (2) Remove the screws marked "A" in Figure 1.
  These screws support the LED board.
- (3) Remove the screws marked "B" in Figure 1, as well as the tension spring, and remove the analog display panel.
- (4) Locate the analog display lamp. Cut the leads to this lamp, insert 1 lead each into the vinyl tube supplied with the counter kit, and position these leads out of the way of the VFO gears, etc.
- (5) Install the orange optical filter on the inside of the front panel of the transceiver, in the position formerly occupied by the analog display panel. Be sure that it is correctly centered. The filter is held in place by the double-face tape included with the filter.
- (6) Install the two guide pins into the holes previously occupied by the "A" screws. When doing this, install the LED board in its previous position. Install the support tower into the hole marked "C" in Figure 1.
- (7) Remove the 820 ohm (Gray-Red-Brown) resistor from the terminal strip marked "E" in Figures 1 and 2.
- (8) Install the COUNTER UNIT. The connection to the guide pins should not be forced. Use the screws previously installed at "A" for securing the counter module at points "C" (support) and "D" in Figure 1. Connect the COUNTER UNIT 9-pin plug into the 9-pin

- socket on the transceiver at point "G" in the drawing. The coaxial cable from the COUNTER UNIT is connected to point "F" in Figure 1.
- (9) Close the transceiver. No alignment of the unit is necessary, unless some change in the preset carrier frequencies is required for a special application. In this case, refer to the section on the COUNTER UNIT in the "ALIGNMENT" chapter of this manual.

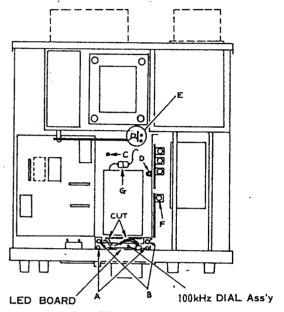
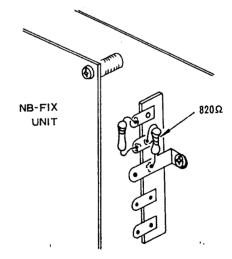


Figure 1



(Enlarged) Part E

Figure 2

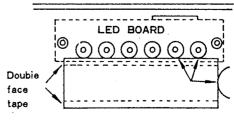
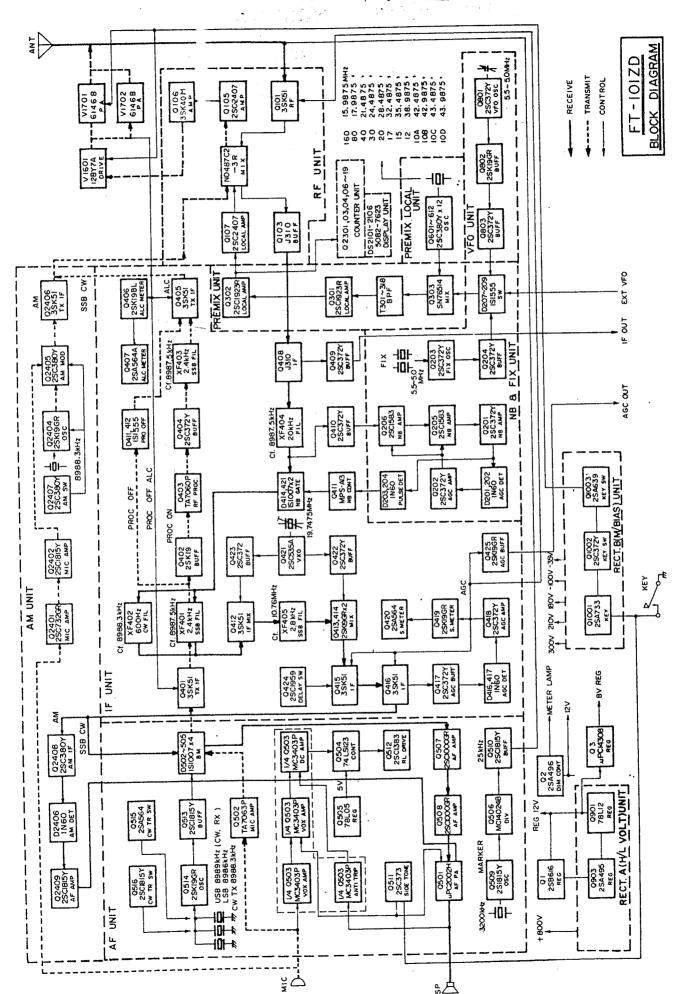


Figure 3



## CIRCUIT DESCRIPTION

The block diagram and following circuit description will provide you with a better understanding of the design of this transceiver. The circuit description is tailored to the full-feature FT-101ZD, and the reader should note that the counter unit and digital display are optional features for the FT-101Z.

The FT-101ZD consists of a premix-type single conversion system, using a 9 MHz IF for all modes of operation.

#### RECEIVER

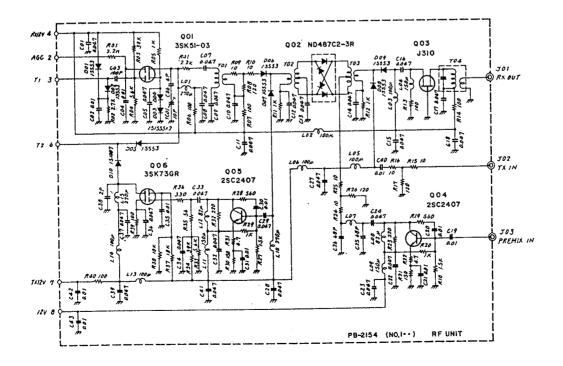
The RF input signal from the antenna is fed through antenna relay  $RL_2$ , lamp fuse  $FH_2$ , attenuator switch  $S_{2004}$  (located on the LEVER SW unit, PB-1975), 9 MHz trap  $L_{2101}$  and  $C_{1207}$  (located on the TRIMMER A UNIT), and input transformer  $T_1$  to pin 3 of the RF UNIT.

#### RF UNIT (PB-2154)

The incoming signal is amplified by the RF amplifier, Q<sub>101</sub> (3SK51-03), a dual-gate MOS FET with excellent rejection of cross modulation and intermodulation. The amplified signal is fed to the Schottky barrier diode module, Q<sub>102</sub> (ND487C2-3R), where the RF signal is mixed with a local signal delivered from Q<sub>104</sub> (2SC2407), resulting in a first IF of 8.9875 MHz. The IF signal is then amplified by Q<sub>103</sub> (J310) and fed to J<sub>101</sub>.

#### IF UNIT (PB-1963)

The IF signal at pin 9 of  $J_{403}$  is amplified by  $Q_{408}$  (J310) and passed through a monolithic filter,  $XF_{404}$ , which has a  $\pm 10$  kHz bandwidth. The monolythic filter provides early protection from IMD, while providing a wide-bandwidth point for noise blanking. The IF signal is then fed to noise blanker gate  $D_{404}$  (1S1007), which functions as an ON/OFF switch controlled by noise blanker driver  $Q_{411}$  (MPSA13).



The IF signal is then passed through the SSB filter  $XF_{401}$  (or optional CW filter  $XF_{402}$ . Selection of the filter to be used is made by dioc as  $D_{405}$  -  $D_{408}$  (1S1007), depending on the mode of operation.

The IF signal is then fed to the 3 first mixer,  $Q_{412}$  (3SK51-03), where the inco sing signal is heterodyned with a 19.7475 MHz  $\pm$  of local signal delivered from crystal oscillator  $Q_{4\pm}$  (2SC535A) and buffer amplifier  $Q_{423}$  (2SC372), resulting in a signal of 10.76 MHz  $\pm \Delta f$ .

The new 10.76 MHz  $\pm \Delta f$  signal is fed through filter XF<sub>405</sub> to the IF second mixer, Q<sub>413</sub>/Q<sub>414</sub> (2SK19GR), where the filtered signal is heterodyned with the 19.7475 MHz  $\pm \Delta f$  signal delivered from Q<sub>422</sub> (2SC372Y), resulting in an 8.9875 MHz IF signal, the same as the original IF.

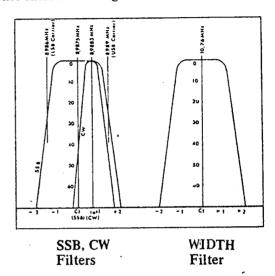
This process varies the IF signal across the passband of the second IF filter. The combination of the two filters,  $XF_{401}$  and  $XF_{405}$ , provides continuously variable width of the IF passband. The frequency of crystal oscillator  $Q_{421}$  is varied by varactor diode  $D_{418}$  (1S2209).

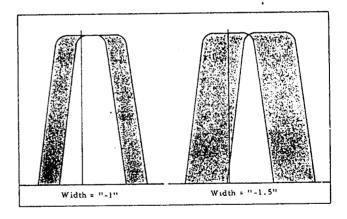
The output from the IF second mixer is fed to a two-stage IF amplifier, consisting of  $Q_{415}$  and  $Q_{416}$  (3SK51-03), and delivered through diode switch  $D_{401}$  (1S1555) to the AF UNIT.

A portion of the output from  $Q_{416}$  is rectified by  $D_{416}$  and  $D_{417}$  (1N60) to produce AGC voltage.  $Q_{417}$  (2SC372Y) provides the necessary buffering between the IF and AGC circuits. The AGC voltage is amplified by  $Q_{418}$  (2SC372Y), and applied to gate 2 of the RF and IF amplifiers, to control the gain of these stages. The AGC voltage is also amplified by  $Q_{419}$  (2SK19GR) for S-meter indication.

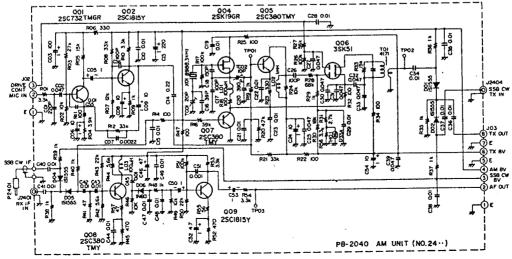
For use with the FV-101Z or FV-901DM scanning VFO, or other optional equipment, the AGC voltage is fed through buffer Q425 (2SK19GR) and fed to the AGC OUT terminal on the EXT VFO jack, located on the rear panel.

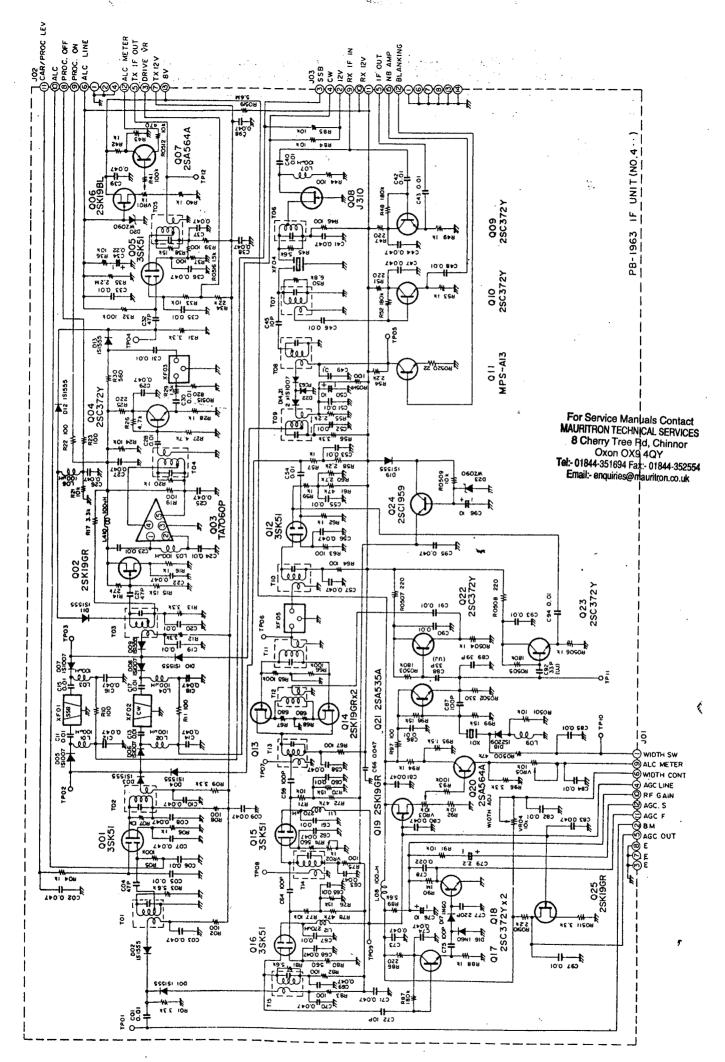
On AM, the output signal from  $Q_{416}$  is amplified by  $Q_{2408}$  (2SC380Y) and passed to the AM detector,  $D_{2406}$  (1N60). The resulting audio signal is amplified by  $Q_{2409}$  (2SC1815Y) and delivered to the final audio stage.





Width Control Action





#### NB-FIX UNIT (PB-1961)

A portion of the 8.9 MHz IF signal is fed through buffer  $Q_{410}$  (2SC372Y) and amplified by  $Q_{206}$  and  $Q_{205}$  (2SC1583).

When a carrier of noise-free modulated signal is received, the IF signal is rectified by  $D_{201}$  and  $D_{202}$  (1N60), producing a DC voltage. This DC voltage is amplified by  $Q_{202}$  (2SC372Y), which charges  $C_{214}$ , for AGC purposes. The AGC voltage is used to control the gain of  $Q_{206}$  and  $Q_{205}$ .

When impulse-type noise is received,  $D_{203}$  and  $D_{204}$  (1N60) rectify the IF signal, producing a DC voltage which controls the NB switch  $Q_{411}$  (2SC372Y).

Noise pulses have a very short duration, but high amplitude. Because of the very slow time constant of the  $C_{214}/R_{212}$  discharge path, AGC voltage is not induced by these short-duration pulses. Therefore,  $Q_{206}$  and  $Q_{205}$  operate at full gain, providing maximum voltage to the base of  $Q_{411}$ . When a pulse is received,  $Q_{411}$  biases  $D_{414}$  to block the signal path momentarily. When a desired signal and a noise pulse are received simultaneously, the blanking action is not impaired, because the relative amplitude difference between the desired signal and the noise pulse is still high. The front panel noise blanker level control varies the DC voltage applied to the base of  $Q_{411}$ .

## AF UNIT (PB-1964)

The IF signal from pin 2 is fed through  $T_{501}$  to the ring demodulator, consisting of  $D_{502}$  -  $D_{505}$  (1S1007), where the IF signal is demodulated into audio, using the carrier signal delivered from  $Q_{503}$  (2SC1815Y). The carrier signal is generated by oscillator  $Q_{514}$  (2SK19GR), and it oscillates at one of the following frequencies:

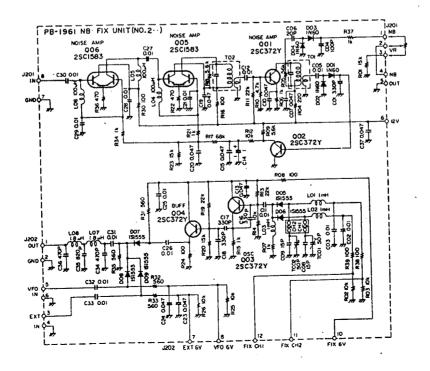
USB, CW·RX	8989 KHz
LSB	8986 KHz
CW-TX	8988.3 KHz

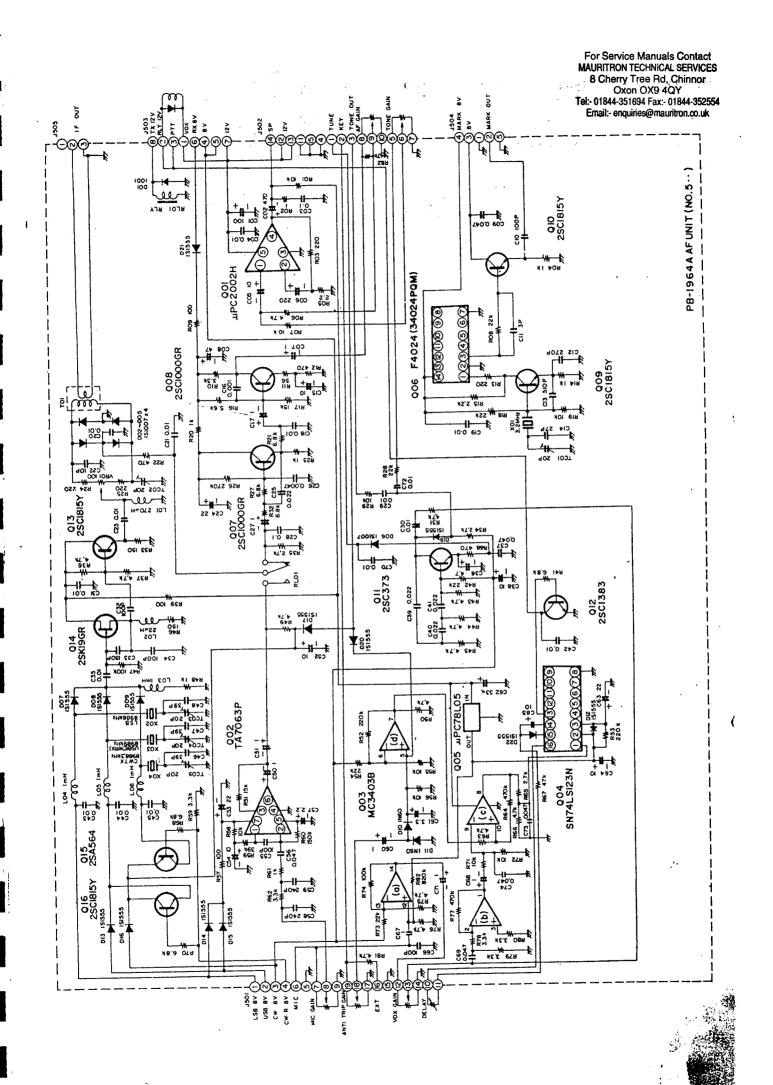
The audio signal is then amplified by audio amplifiers  $Q_{507}$ ,  $Q_{508}$  (2SC1000GR), and  $Q_{509}$  ( $\mu PC2002$ ), delivering 3 watts of audio output to the speaker.

The audio spectrum is shaped by an active low-pass filter of  $f_0 = 2.7$  kHz, -12 dB/octave.

# MARKER GENERATOR

A 25 kHz marker signal is provided, for alignment and testing purposes. Marker generator  $Q_{509}$  (2SC1815Y) generates a basic 3200 kHz signal, which is divided into 25 kHz multiples by  $Q_{506}$  (MC14024B), a binary counter.





#### TRANSMIT CIRCUIT

#### SSB MODE

The output from microphone jack  $J_2$  is fed through the MIC GAIN control VR3a to pin 8 of the AF UNIT.

# AF UNIT (PB-1964A)

The speech signal from pin 8 is amplified by microphone amplifier  $Q_{502}$  (TA7063P) and fed through relay  $RL_{501}$  to the ring modulator,  $D_{502}$  -  $D_{505}$ , where the speech signal modulates the carrier signal delivered from  $Q_{513}$ . The resulting double sideband signal is fed to the IF UNIT.

#### IF UNIT (PB-1963)

The 8.9875 MHz double sideband signal is amplified by  $Q_{401}$  (3SK51-03) and passed through sideband filter XF<sub>401</sub> by diode switches  $D_{403}$ ,  $D_{409}$  (1S1555),  $D_{405}$ , and  $D_{407}$  (1S1007). Here the signal is converted to a single sideband signal by removal of the unwanted sideband.

The signal is then fed to buffer amplifier  $Q_{402}$  (2SK19GR). When the RF speech processor is OFF, diode switches  $D_{411}$  and  $D_{412}$  (1S1555) feed the IF signal to IF amplifier  $Q_{405}$  (3SK51-03). When the RF speech processor is ON, the SSB signal is amplified by buffer amplifier  $Q_{402}$  (2SK19GR) and further amplified by limiter  $Q_{403}$  (TA7060P), where signals that exceed the preset clipping level are sliced out.

This highly clipped SSB signal is amplified by buffer amplifier  $Q_{404}$  (2SC372Y) and passed through a selective filter,  $XF_{403}$ , which removes RF harmonics that result from signal clipping. The signal is then fed to IF amplifier  $Q_{405}$ , and subsequently delivered to the RF UNIT. The front panel COMP LEVEL control,  $VR_4$ , controls the voltage at gate 2 of  $Q_{401}$ , thus setting the processor level.

The return of the grid circuit of the final amplifier tubes is fed to Q<sub>406</sub> (2SK19BL), which produces ALC, stage. This voltage is fed to gate 1 of Q<sub>405</sub>,

controlling the gain of this stage. When the RF processor is off, ALC voltage is also fed to gate 1 of  $Q_{401}$ .  $Q_{407}$  (2SA564) amplifies the ALC voltage for indication on the front panel meter.

#### RF UNIT (PB-2154)

The IF signal from J<sub>102</sub> is delivered to the Schottky barrier diode module Q<sub>102</sub> (ND487C2-3R), where the IF signal is mixed with a local signal delivered from Q<sub>104</sub> (2SC2407), producing the RF output signal. The RF signal is then amplified by Q<sub>105</sub> (2SC2407) and Q<sub>106</sub> (3SK40M), and fed through diode switch D<sub>110</sub> (1S1007) to the DRIVE UNIT.

# DRIVE UNIT (PB-1714), PA UNIT (PB-1715)

The RF signal is amplified by driver  $V_{1601}$  (12BY7A), and delivered to PA UNIT final amplifier tubes  $V_{1701}$  and  $V_{1702}$  (6146B). The output from the final tubes is fed to the antenna jack.

A portion of the RF signal is coupled through  $C_{14}$  to the cathode of the 12BY7A driver, for the purpose of improving the linearity of the final amplifier. This technique is known as RF negative feedback.

#### CW MODE

For CW, the 8.9883 MHz carrier is generated by oscillator  $Q_{514}$  at the frequency set by  $X_{504}$ . The carrier signal is fed through buffer  $Q_{513}$  and fed to the ring modulator. The same carrier frequency is used in the tune mode.

DC voltage is applied through diode switch  $D_{517}$  (1S1555) and relay  $RL_{501}$ , unbalancing the ring modulator for CW operation. The carrier signal is then fed to the IF UNIT. The signal path is identical to that on SSB, up to the DRIVE UNIT.

# DRIVE UNIT (PB-1714), PA UNIT (PB-1715)

Keying of the transmitter is accomplished by changing the bias voltage to the driver and final tubes. During "key up," the tubes are cut off by application of -35 volts to  $V_{1601}$  and -110 volts to  $V_{1701}$  and  $V_{1702}$ . These cutoff voltages are

reduced to -0.1 volt and -60 volts, respectively, during "key down" conditions.

The key is connected to the KEY 2 terminal on the RECT B board, PB-1968. When the key is closed, the base of  $Q_{1001}$  (2SA733) is grounded, causing  $Q_{1002}$  (2SC372Y) to conduct. The base of  $Q_{1003}$  (2SA639) is thus set to 0 when the transistor conducts. Under these circumstances, the bias voltage applied to  $V_{1601}$ ,  $V_{1701}$ , and  $V_{1702}$  places these tubes in the normal operating condition.

#### VOX circuit

A portion of the microphone input signal is amplified by three stages of  $Q_{503}$  (MC3403P), which drive the VOX control gate,  $Q_{504}$  (SN74LS123N). The output from pin 13 of  $Q_{504}$  is fed to the base of  $Q_{512}$  (2SC1383), switching the VOX relay on and off according to the presence or absence of a speech signal.

A portion of the speaker output is detected by  $D_{510}$  and  $D_{511}$  (1N60), providing a bucking voltage which is fed to  $Q_{503}$ , preventing the speaker output from tripping the VOX.

The VOX delay may be set by adjusting VR<sub>2b</sub> for the desired delay time.

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#### CW SIDETONE

CW sidetone oscillator  $Q_{511}$  (2SC373) oscillates at a frequency of approximately 800 Hz. The output from  $Q_{511}$  is amplified by the final audio

amplifier,  $Q_{501}$ , for delivery to the speaker. The output from the sidetone oscillator is also fed to VOX amplifier  $Q_{503}$ , providing semi-break-in operation for CW.

#### AM MODE

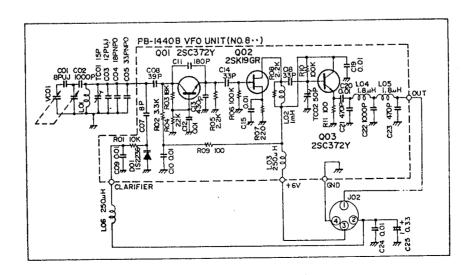
The speech signal from the microphone is amplified by Q<sub>2401</sub> (2SC732GR) and Q<sub>2402</sub> (2SC1815Y) and passed to modulator Q<sub>2405</sub> (2SC380Y), where the speech signal modulates the AM carrier signal at 8988.3 kHz delivered from Q<sub>2404</sub> (2SK19GR). The modulated signal is amplified by Q<sub>2406</sub> (3SK51) and delivered to transmit mixer Q<sub>105</sub>/Q<sub>106</sub>.

#### **COMMON CIRCUITS**

#### VFO UNIT (PB-1440B-3420)

A modified Colpitts-type oscillator is used to generate a 5.0 - 5.5 MHz VFO signal, thus producing a 500 kHz tuning range. The oscillator signal generated by  $Q_{801}$  (2SC372Y) is varied by  $VC_{801}$ , which is geared to a precision-built dial tuning mechanism.  $VC_{801}$  consists of two sections; the sub-blades compensate for the capacitance variation of the main blades, which may result from extreme temperature change.

Varactor diode  $D_{801}$  (1S2209) may be varied by tuning  $L_{806}$ , providing  $\pm 2.5$  kHz offset from the dial frequency (clarifier).



The VFO signal is amplified by buffer amplifiers  $Q_{802}$  (2SK19GR) and  $Q_{803}$  (2SC372Y), and passed to the PREMIX UNIT.

# NB & FIX UNIT (PB-1961)

Two crystal-controlled channels are provided for pperation with this transceiver. The oscillator signal is generated by  $Q_{203}$  (2SC372Y) and amplified by  $Q_{204}$  (2SC372Y), and delivered to the PREMIX UNIT. Crystals  $X_{201}$  and  $X_{202}$  oscillate in the 5.0 - 5.5 MHz range.

# PREMIX LOCAL UNIT (PB-2153)

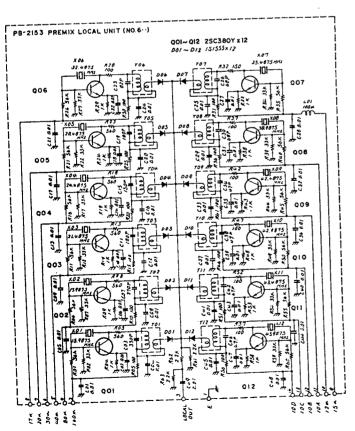
Crystal oscillators Q<sub>601</sub>-Q<sub>612</sub> (2SC380Y) generate the premix local signal at the frequencies shown in Table 3. Diode switches D<sub>601</sub>-D<sub>612</sub> (1S1555) select the proper local signal for the band in use. The local signal is then delivered to the PREMIX UNIT.

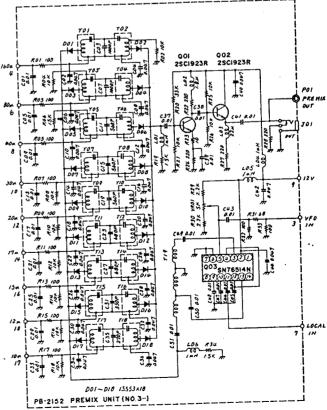
PREMIX UNIT (PB-2152)

The premix signal is produced at Q303 (SN76514N), a double-balanced mixer, where the premix local signal from Q601-Q612 is mixed with the VFO or crystal controlled 5 MHz signal. The premix output frequencies are shown in Table 3. The premix signal is passed through bandpass filter T301-T304, and amplified by Q301, Q302 (2SC1923R). The amplified signal is then fed to the RF UNIT, where the signal is further amplified by Q107 for delivery to the transmitter and receiver mixers.

		XCO Frequency	PREMIX OUT Frequency
160m	X 601	15.9875MHz	10.4875~10.9875MHz
80 m	X 602	17.9875MHz	12.4875~12.9875MHz
40 m	X 603	21.4875MHz	15.9875~16.4875MHz
30 m	X 604	24.4875MHz	18.9875~19.4875MHz
20 m	X 605	28.4875MHz	22.9875~23.4875MHz
17 m	X 606	32.4875MHz	26.9875~27.4875MHz
15 m	X 507	35.4875MHz	29.9875~30.4875MHz
12 m	X 608	38.9875MHz	33.4875~33.9875MHz
10 m A	X 609	42.4875MHz	36.9875~37.4875MHz
10 m B	X 610	42.9875MHz	37.4875~37.9875MHz
10 m C	X 611	43.4875MHz	37.9875~38.4875MHz
10 m D	X 612	43.9875MHz	38.4875~38.9875MHz

Table 3





#### COUNTER UNIT (PB-2086A-3420/PB-2098)

The local oscillator signal is applied to Large-Scale Integrated Circuit (LSI) chip for display on the front panel digital display.

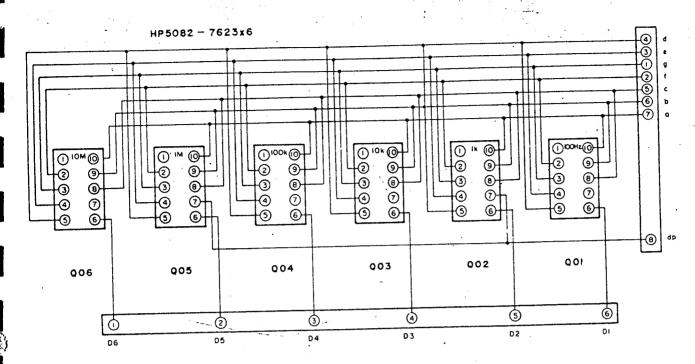
The premix signal as shown in Table 4 from the LOCAL Unit, is amplified by  $Q_{2301}$ . The amplified signal is further amplified by  $Q_{2303}$  (2SC1674) and delivered to the LSI counter chip,  $Q_{2312}$  (MSM95 20RS). A portion of the output from  $Q_{2303}$  is amplified by  $Q_{2304}$  (2SC1815Y) and fed to gate 2 of  $Q_{2301}$  controlling the gain of those amplifiers.

The output from the LSI is fed to the display. The output from pins 24 through 30 is delivered to segment drivers  $Q_{2313}-Q_{2319}$  (2SA952L) and digit drivers  $Q_{2306}-Q_{2311}$  (2SA952L) through a dynamic drive configuration. Display is performed by  $D_{2201}-D_{2206}$  (HP5082-7623), seven-segment light-emitting diodes.

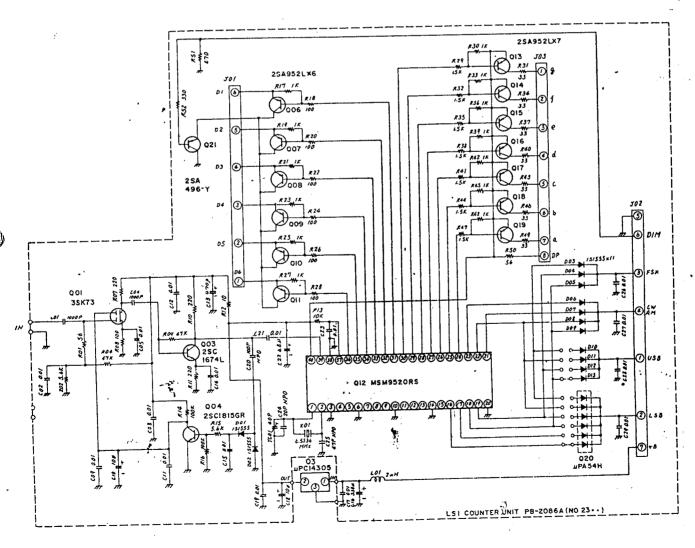
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	Nominal Premix Local Frequency	L S B	USB	CW, AM
160 m	10.4875—10.9875(MHz)	10.486-10.986(MHz).	10.489-10.989(MHz)	10.4883-12.9883(MHz)
80 m	12.4875-12.9875	12.486-12.986	12.489-12.989	12.4883-12.9883
40 m	15.9875—16.4875	15.986—16.486	15.989-16.489	15.9883-16.4883
30 m	18.9875—19.4875	18.896-19.486	18.989-19.489	18.9883-19.4883
20m	22.9875-23.4875	22.986-23.486	22.989-23.489	22.9883-23.4883
17 m	26.9875-27.4875	26.986-27.486	26.989-27.489	26.9883-27.4883
15 m	29.9875-30.4875	29.986-30.486	29.989-30.489	29.9883-30.4883
12m	33.4875-33.9875	33.486-33.986	33.489-33.989	33.4883-33.9883
7 10m A	36.9875-37.4875	36.986-37.486	36.989-37.489	36.9883-37.4883
10m B	37.4875-37.9875	37.486-37.986	<b>37.4</b> 89-37.989	37.4883-37.9883
10 m € .	37.9875—38.4875	37.986-38.486	37.989-38.489	37.9883-38.4883
10m D	38.4875—38.9875.	38.486-38.986	38.489-38.989	38.4883-38.9883

Table 4



DISPLAY UNIT PB-2098



DISPLAY/COUNTER UNIT

# POWER SUPPLY

The power supply is designed to operate from 100/110/117/200/220/234 volts AC. A DC-DC converter is an available option, previding operation from 13.5 volts DC. Insertion of the appropriate power plug into the rear panel receptacle makes the necessary connections for AC or DC operation.

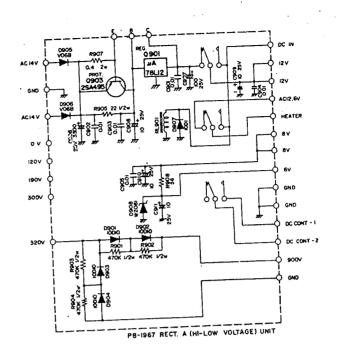
When the transceiver is operated from a DC 13.5 volt power source, using the optional DC-DC converter, transistors Q<sub>3201</sub> and Q<sub>3202</sub> (T20A6) function as a low frequency oscillator, providing AC voltage at approximately 80 Hz to the power transformer. All of the tube heaters receive their power through the HEATER switch on the front panel. When the HEATER switch is OFF, voltage is still supplied to the receiver section, thus allowing continuous reception with reduced power consumption. The heaters of the two 6146B are connected in series to operate at 12 volts DC.

The 14 volt AC power delivered from the secondary winding of the power transformer is rectified by  $D_{905}$  and  $D_{906}$  (V06B). Voltage regulators  $Q_1$  (2SB616),  $Q_{901}$  (78L12), and  $Q_{903}$  (2SA495) stabilize the DC supply at 12 volts. The supply voltage is further stabilized at 8 volts by  $Q_3$  ( $\mu$ PC14308) for delivery to the counter, AF, and other units. The 6 volt supply for the VFO is provided through zener diode  $D_{908}$  (WZ061), while the 5 volt supply for the TTL integrated circuits is provided by  $Q_{505}$  (78L05).

The power amplifier plate voltage of +800 volts is supplied from the bridge-controlled doubler, located on the RECT. A UNIT, and consisting of  $D_{901}$  -  $D_{904}$  (10D10).

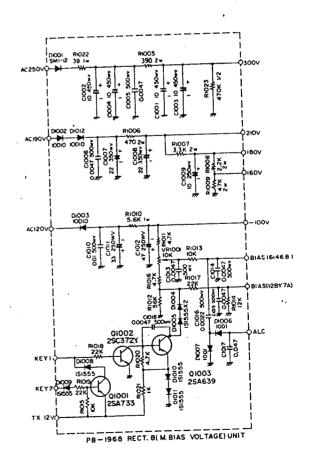
AC 190 volts is rectified by  $D_{1002}$  (10D10), producing 210 volts for the screen grid supply of the power amplifier tubes. The screen grid voltage for the driver tube is obtained by rectifying 250 volts AC at  $D_{1001}$  (10D10), producing 300 volts. This voltage is dropped to 180 volts by a resistor for delivery to the driver tube screen grid.

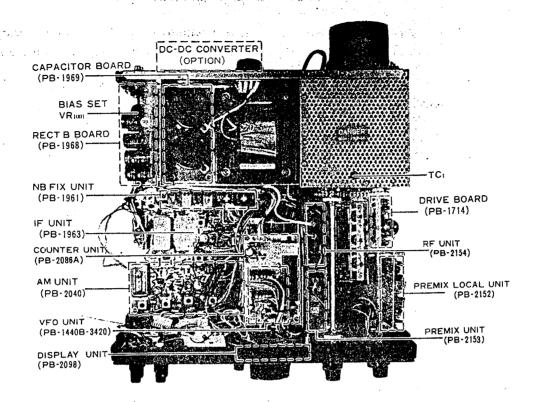
The 120 volt AC power from the transformer secondary winding is rectified by  $D_{1003}$  (10D10) in order to obtain -140 volts for the driver and final amplifier tube grid bias.



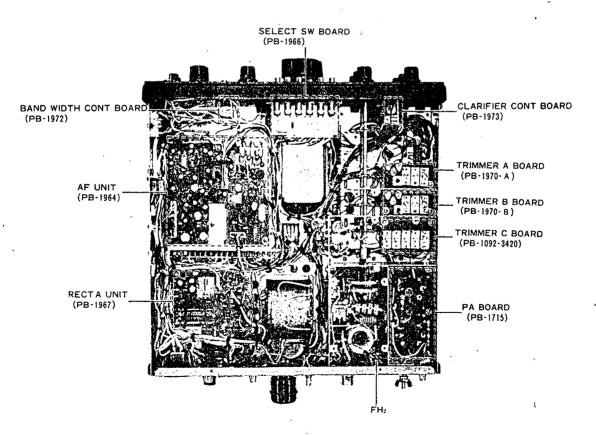
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C





TOP VIEW



BOTTOM VIEW

#### MA VIENANCE AND ALIGNMENT

#### **WARNING**

DANGEROUS VOLTAGES RE PRESENT WITHIN THIS TRANSCEIVER. USE EXTREME CAUTION WHEN WORKING ON THE TRANSCEIVER WITH THE COVERS REMOVED. DISCHARGE ALL CAPACITORS BY SHORTING THEM TO GROUND WITH AN INSULATED SCREWDRIVER AFTER POWER HAS BEEN REMOVED. OBSERVE NORMAL SAFETY PRECAUTIONS AT ALL TIMES.

#### **CAUTION**

Never operate this transceiver in the transmit mode without a matched antenna or dummy load connected to the antenna receptacle on the rear panel. It is possible to damage the final amplifier tubes and the pi network components if the transmitter is operated without the proper load termination.

#### **GENERAL**

This transceiver has been carefully aligned and tested at the factory. With normal use, it should not require other than the usual attention given to electronic equipment. Service or realignment of a major component may require substantial adjustment; under no circumstances, though, should realignment be attempted unless the operation of the transceiver is fully understood, the malfunction has been carefully analyzed, and the fault has definitely been traced to misalignment. Sudden difficulties are almost always caused by component failure rather than misalignment.

Service work should only be performed by experienced personnel, using the proper test equipment.

#### **EQUIPMENT REQUIRED**

(1) RF Signal Generator: Hewlett-Packard Model 606A or equivalent, with one volt output at 50 ohms, and frequency coverage to 30 MHz.

- (2) Vacuum Tube Voltmeter (VTVM): Hewlett-Packard Model 410B or equivalent, with an RF probe good to 40 MHz.
- (3) Dummy Load: Yaesu Model YP-150 or equivalent, with 50 ohm non-reactive load impedance, rated to 150 watts average power.
- (4) AF Signal Generator: Hewlett-Packard Model 200AB or equivalent.
- (5) A general coverage receiver covering 3 to 30 MHz, with a 100 kHz crystal calibrator.
- (6) A frequency counter, Yaesu Model YC-500 or equivalent, with resolution to 0.01 kHz and frequency coverage to 30 MHz.
- (7) An oscilloscope, Hewlett-Packard Model 1740A or equivalent.

#### AF UNIT ALIGNMENT

#### **VOX** Circuit

#### A. Antitrip level setting

- 1. Tune in a signal on the FT-101ZD receiver, and adjust the AF GAIN control for a normal listening level. Position the microphone near the speaker, with the MODE switch in the SSB mode. Increase the VOX GAIN control on the front panel until the speaker output causes the VOX relay to switch the transceiver to transmit. Set the ANTITRIP control VR<sub>9</sub>, located on the rear apron, to the point that will just prevent the speaker output from tripping the VOX relay.
- Now place the microphone in the normal operating position, and speak into the microphone to see if your voice will activate the VOX relay. If not, VR, may be advanced too far.

#### B. VOX relay delay setting

1. Adjust the DELAY control VR<sub>2b</sub>, located on the front panel, for the desired delay time. This may require a different setting for phone and CW operation, owing to differing operating techniques. For CW or phone operation using a footswitch, the VOX GAIN control may be rotated fully counter-clockwise to the PTT position.

#### CW Sidetone

1. The CW sidetone level may be adjusted by means of VR<sub>10</sub>, located on the rear apron.

#### Marker Frequency setting

1. Preset the controls as follows:

BAND . . . . . 30 m DIAL . . . . . 10 MHz

 $\label{eq:presentation} \mbox{PRESELECT} \ . \ \mbox{Peaked for maximum response}$ 

MODE ..... TUNE

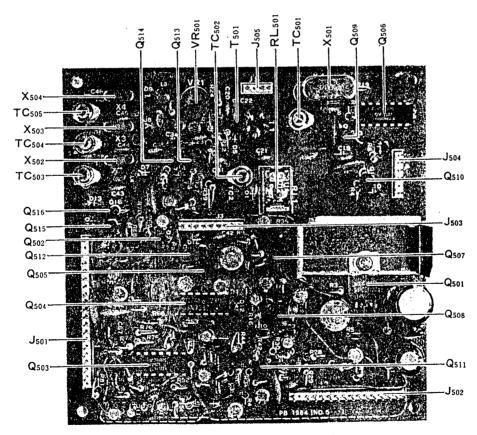
2. Place the NB/MARK switch in the MARK position. Tune in the WWV or JJY signal, and adjust TC<sub>501</sub> for an exact zero beat with the carrier of the incoming signal.

# Carrier Frequency Adjustment

## A. SSB Carrier Point

- 1. Tune up the transmitter on 20 meters, LSB mode, into a dummy load. Apply a 1 kHz audio signal to the microphone input, and adjust the audio generator output until the transmitter power output is 60 watts, as indicated on the dummy load wattmeter.
- Shift the audio generator output frequency to 300 Hz, without changing the output level. Adjust TC<sub>503</sub> for a power output reading of 15 watts on the wattmeter.
- 3. Shift the MODE switch to USB. Adjust TC<sub>504</sub> for an identical 15 watt reading on the wattmeter.

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AF UNIT (PB-1964)

4. Recheck the LSB adjustme t, as well as the carrier balance adjustment, after performing the carrier point alignment. The background noise, when switching between USB and LSB, should not change.

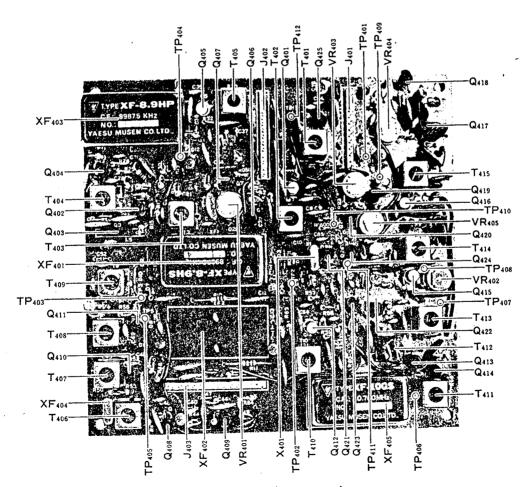
# B. Carrier Balance

- 1. Tune up the transceiver or 20 meters, USB mode, into a dummy load. Set the main tuning dial to 14.250 MHz. Connect the RF probe of the VTVM to the antenna jack. Disconnect all microphones, etc., from the microphone jack.
- 2. Activate the transmitter by placing the VOX GAIN control into the MOX position. Adjust VR<sub>501</sub> and TC<sub>502</sub> for a minimum VTVM reading.
- 3. If a VTVM is unavailable, use an external

- monitor receiver, tuned to the transmitter frequency, and adjust VR<sub>501</sub> and TC<sub>502</sub> for a minimum S-meter reading on the external receiver.
- 4. This adjustment should be repeated several times on LSB and USB, in order to ensure complete carrier nulling.

# C. CW Carrier Point

- 1. Connect a frequency counter to TP<sub>402</sub>, located on the IF UNIT. Place the MODE switch in the TUNE position.
- 2. Adjust TC<sub>505</sub> for a frequency counter reading of exactly 8988.3 kHz.
- 3. When using the optional CW filter, a substantial loss on transmit, when in the CW-N position, may indicate the need for adjustment as indicated in steps 1 and 2.



IF UNIT(PB-1963)

#### IF UNIT ALIGNMENT

# S-Meter Sensitivity Adjustment

- Set the BAND switch to 20 meters, the main dial to 14.250 MHz, and set the RF GAIN fully clockwise.
- Set the signal generator to 14.250 MHz, and 2. set its output to 6 dB. Tune the signal generator signal on the receiver, and peak the preselector for maximum signal strength. The S-meter should just begin to move with the 6 dB input.
- Adjust VR<sub>403</sub> for a reading of 0 on the S-3. meter.
- Set the generator output to 100 dB, and adjust VR<sub>405</sub> for a reading of S9 + 60 dB on the S-meter. Confirm that the preselector is peaked.
- Return the signal generator output to 6 dB, and recheck the adjustment of VR402.

# Variable IF Bandwidth Alignment

Set the controls as follows:

BAND ..... 20 m

DIAL ..... 14.200 MHz

RF GAIN ..... Fully clockwise

WIDTH switch . . OFF

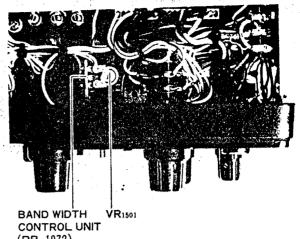
MODE ..... USB

Peak the preselector for maximum response against the marker signal or background noise.

- Connect the frequency counter to TP<sub>411</sub>. Adjust VR<sub>1501</sub> for a reading of exactly 19.7475 MHz.
- Place the WIDTH switch ON. Make sure that the WIDTH control is exactly in the 12 o'clock position. Adjust VR<sub>404</sub> for a reading of exactly 19.7475 MHz on the frequency counter.
- Switch between USB and LSB, and observe the background noise. If there is any difference, adjust VR 1501 until the background noise is the same.

#### ALC Meter Alignment

- On any band, set the MODE switch to USB. Set the meter switch to ALC.
- With no speech input, activate the transmitter. Adjust VR401 for a 0 reading on the ALC meter scale.

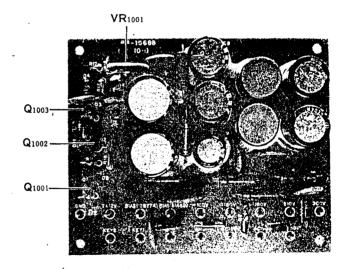


(PB-1972)

#### RECTIFIER B UNIT

# Bias Adjustment

- Set the MODE switch to USB or LSB, and set the MIC GAIN control fully counterclockwise.
- Place the METER switch in the IC position, and set the VOX GAIN control to VOX. Adjust the BIAS control located on the RE-CT, B UNIT (PB-1968) VR1001, for a reading of 50 mA. For 10 watt models, the correct meter reading is 25 mA.



RECT B UNIT (PB-1968)

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#### VFO UNIT

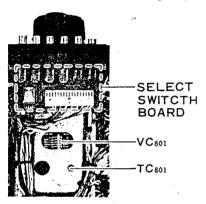
The VFO UNIT is very critical in its adjustment. As well, this is not an area which should ever require alignment. Questions regarding drift, etc., usually can be traced to other areas of the transceiver (instability in the supply voltage, etc.). For this reason, all cases regarding VFO repair should be referred to an experienced service technician.

The following components are of interest from a service standpoint:

TC<sub>801</sub> is the band set trimmer.

TC<sub>802</sub> is the VFO level set trimmer.

To confirm proper VFO injection, connect the VTVM to the VFO output. Adjust  $TC_{802}$  for a reading of 100 mV.



BAND	CRYSTAL	FREQUENCY	TRANS- FORMER
160 m	Х 601.	15.9875MHz	T 601
80 m	X 602	17.9875	T 602
40 m	X 603	21.4875	Т 603
30 m	X 604	24.4875	T 604
20 m	X 605	28.4875	T 605
17 m	Х 606	32.4875	T 606
15 m	X 607	35.4875	T 607
12 m	Хеов	38.9875	Твов
10 m A	Х бов	42.4875	Т 609
10 m B	X 610	42.9875	T 610
10 m C	X 611	43.4875	T 611
10 m D	X 612	43.9875	T 612

Table 6

#### **NB-FIX UNIT**

# Fixed Channel Frequency Alignment

When the optional fixed channel crystals are being used, they may be placed exactly on the correct frequency by adjusting  $TC_{201}$  (for channel 1) and  $TC_{202}$  (for channel 2). Confirmation of the correct frequency may be made with an external receiver or by loosely coupling a probe from the frequency

counter to the transmitter output. A 1-turn loop is usually sufficient to provide indication on the counter.

#### PREMIX LOCAL UNIT

### Premix Local Alignment

- 1. Connect the RF probe of the VTVM to pin 1 of MJ<sub>3</sub>.
- 2. Refer to Table 6, and adjust the appropriate transformer for a level of 300 mV for each band and crystal, as shown in the table.

### PREMIX UNIT

For this alignment, a wideband (not peak) sweep generator, as well as an oscilloscope, should be used.

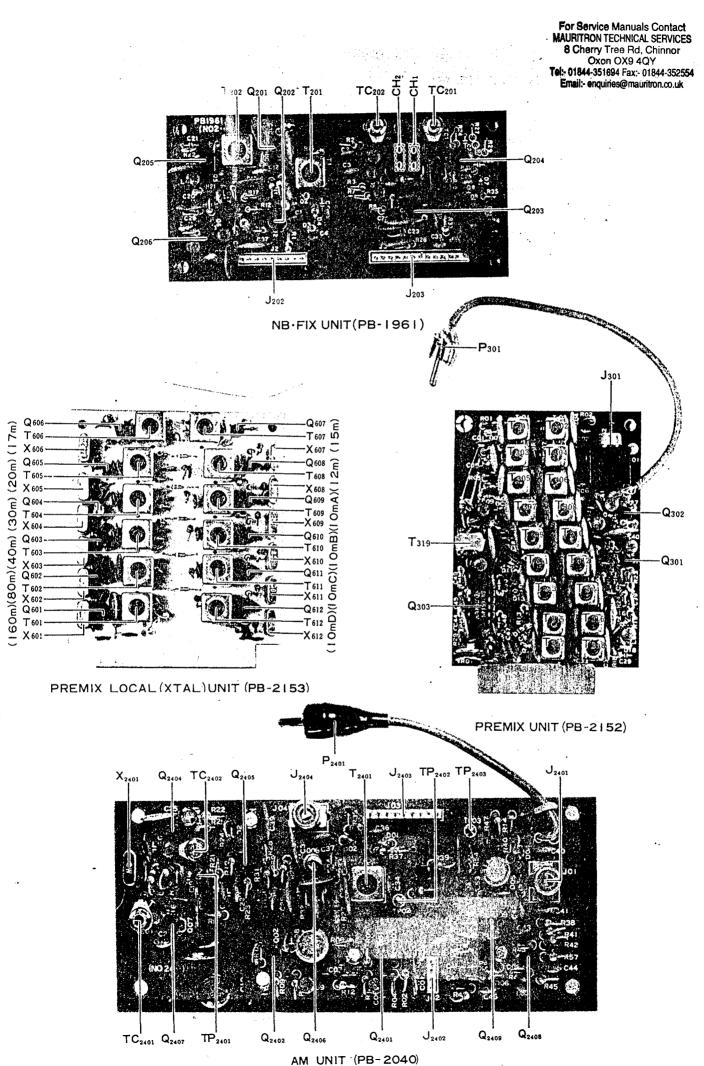
- 1. Press the EXT select switch. Apply 5.0 5.5 MHz sweep output to the VFO output terminal at the rear apron external VFO jack. Connect a high-impedance probe of an oscilloscope to J<sub>301</sub>.
- Adjust the transformers shown in Table 7
  for a flat response across the entire passband.
  If you have never adjusted a bandpass filter
  previously, this may take some practice.
  Perform the adjustments on each band, according to the chart.

00141115 10 11.	o onur ti	
BAND	TRANS- FORMER	PASSBAND
160 m	T 301, T 302	10.4-11.0(MHz)
80 m	Тзоз, Тзо4	12.4-13.0
.40 m	Т 305, Т 306	15.9-16.5
30 m	Т 307, Т 308	18.9—19.5
20 m	Т 309, Т 310	22.9-23.5
17 m	T 311, T 312	26.9-27.5
15 m	T 313, T 314	29.9-30.5
12 m	T 315, T 316	33.5-34.0
10 m A	T 317, T 318	36.9-39.0

#### AM UNIT

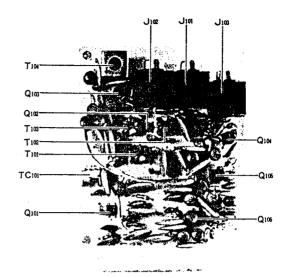
## Table 7

- 1. Set the BAND switch to 40, the MODE switch to AM, and the DRIVE control to the 3 o'clock position. Tune up the transmitter in the usual fashion. Now adjust the core of T<sub>2401</sub> for maximum power output into the dummy load/wattmeter.
- Connect a frequency counter to TP<sub>2402</sub>.
   Adjust TC<sub>2401</sub> for a counter reading of exactly 8988.3 kHz while transmitting.
- Connect the RF probe of the VTVM to TP<sub>2401</sub>, and adjust TC<sub>2402</sub> for a reading of 50 mV while transmitting.



# TRANSMIT RF/IF TRANSF∈ RMER ALIGNMENT

- (1) Connect a dummy load of the antenna jack, and connect an audio sig al generator to the microphone input. Tune up the transmitter at 14.2 MHz, and adjust the audio generator output for approximately 50 watts output into the dummy load, single-tone, SSB mode.
- (2) Peak T<sub>401</sub> T<sub>403</sub> and T<sub>405</sub> (IF UNIT) for maximum power output. Switch the RF processor on, and adjust the COMP LEVEL control for approximately 50 watts output. Peak T<sub>404</sub> for maximum power output.



RF UNIT (PB-2154)

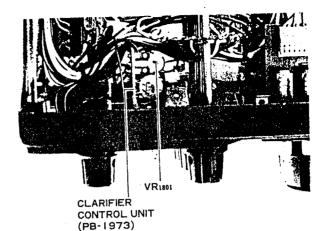
1

# RECEIVER RF/IF/NB TRANSFORMER ALIGNMENT

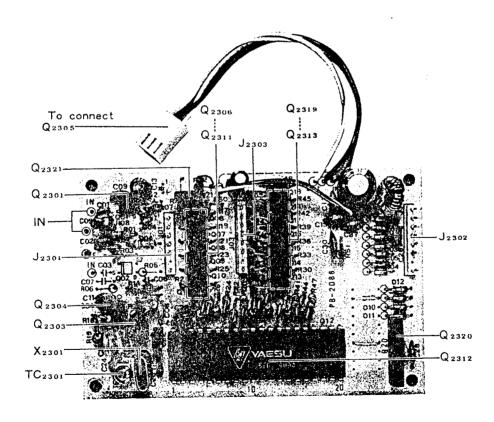
- (1) Tune in the marker generator signal at 14.2 MHz, with a dummy load connected to the antenna jack. Peak the preselector for maximum S-meter indication.
- (2) Peak T<sub>104</sub> (RF UNIT) for maximum S-meter indication.
- (3) Peak  $T_{406}$   $T_{411}$  and  $T_{413}$   $T_{415}$  for maximum S-meter indication.
- (4) Connect the RF probe of a VTVM to the collector of Q<sub>202</sub> (NB-FIX UNIT). Reduce the RF GAIN control somewhat, and tune T<sub>201</sub> and T<sub>202</sub> for a dip in the VTVM indication. If no dip is observed, reduce the RF GAIN control further.

# CLARIFIER ALIGNMENT

- 1. Tune in the marker generator signal on any band, and peak the preselector on the marker signal.
- 2. With the CLARIFIER control OFF, make sure that the CLARIFIER knob is exactly at the 12 o'clock position. Note the tone of the marker signal.
  - 3. Switch the RX CLARIFIER to ON, and observe the tone of the marker signal. If it is different from when the clarifier was turned off, adjust VR<sub>1801</sub> for an identical tone with the CLARIFIER knob exactly on the zero mark.



For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:-01844-351694 Fax:-01844-352554
Email:-enquiries@mauritron.co.uk



COUNTER UNIT (PB-2086A)

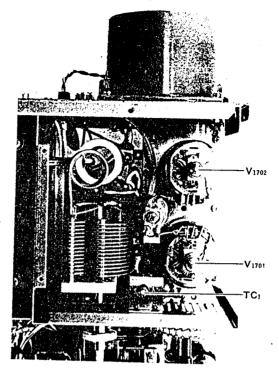
# FINAL AMPLIFIER NEUTR LIZATION

Important Note: For this all ment, use a NON-METALLIC tuning wand.

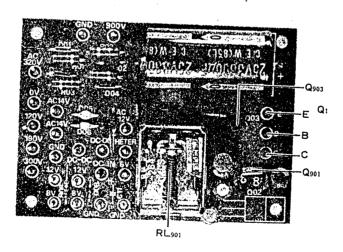
- 1. Set the BAND switch to 10C, set the tuning dial to 29 MHz, and tune into a dummy load for approximately 70% ft output power.
- 2. Set the METER switch to 'C, and observe the dip in the cathode current. The dip should occur at the same point that maximum power output (measured on the dummy load wattmeter) occurs. If this is not the case, adjust TC<sub>1</sub>; located inside the final amplifier cage, for the required coincidence of maximum power output and dip on the IC meter.

CAUTION: HIGH VOLTAGES ARE PRESENT ON THE UNDERSIDE OF THE CHASSIS AND INSIDE THE FINAL AMPLIFIER COMPARTMENT. USE GREAT CARE WHILE MAKING ADJUSTMENTS IN AREAS OF EXPOSED WIRING.

Note: The final amplifier enclosure must be in place to provide the required RF shielding during the neutralization procedure.



Final Amplifier Compartment



RECT A UNIT(PB-1967)

	MAIN CH	ASSIS **	C	25	K30279062	Dipped mica (Di	500 WV ( 419-302K5)	
nbol No.	Parts No.	D scription			K31306800	Moulded mic		80 pF
	IC	, TRANSISTOR		37,00	123 1300000	Ceramic	500 WV	1 pF
	G3104960Y T			217	K02279002	11	"	5 pF
	G3206160R '	2020101(4)		210	K02279003	11	,,	47 pF
	G34023500 '	200250(0)		C18	K00279001	"	,,	200 pF
	G1090070 IC			C11	K00279002	"	,,	470 pF
	G1090080 "	μPC78L08		C20	K0030003	,,	1 KV	3 pF
				C16	K02309002	11	,,	5 pF
				C15	K02309003	"	"	100 pF
	0	OIODE		C14	K00329002	,,	1.5 KW	V 460 pF
	G2090029 C	Ge 1N60		C3	K00329001	"	3 KV	100 pF
2-5	G2015550 S	i 1S1555		C9	K12359001	,,	"	1000 pF
5	G2090001	, 10D1		C1	K13170102	<del> </del>	50WV	0.001 μF
				C73-75	K13170102		50 WV	0.01 μF
				C29, 34, 35,	KISTIOIOS			
				41,64	K13170473	,,	,,	0.047 μF
	1	RESISTOR		C12, 22-24,	KISTIOTIS			
22, 24	J01245220 (	Carbon film 1/4W TJ	22 Ω	39, 40, 56,	1			
23	J00245330	., ., ., γΙ	33 Ω	58, 60, 68,				
14	J01245560	., ., ., ., ., ., ., ., ., ., ., ., ., .	56 Ω	69	K12279004	1 "	500 W	V 0.0047 μF
7, 11	J01245101	<i>11 11 11 11</i>	100 Ω	C27, 28, 36			"	0.01 μF
.18	J01245821		820 Ω	C30,32,33,54,	K1227900	4		
4, 5	J01245102		1 kΩ	55, 61	K1232900	2 "	1.4 KV	/ 0.0047 μF
16	J01245152	" " " "	1.5 kΩ	C2, 25, 26	K1232900		,,	0.01 μF
119	J01245182	n n n n	1.8 kΩ	C31, 37	K2127000		500 W	V 0.001 μF
217	J01245222		2.2 kΩ	C42-51	K2127000		(ECK-L2H10	2PE)
320	J01245474	n n n n	470 kΩ		K4012047			
₹2	J10276100	Carbon composition 1/2W (	GK 10 Ω	C63	K4012010		50WV	
39, 10	_	" " 1W	" 56 Ω	C72			,,	330 μF
with L5, L6	,			C65	K4012033		.,	10 μF
R3	J10276101	" "	" 100 Ω	C70	K4012010		10 W	
R1	J10276222	,, ,, ,,	" 2.2 kΩ	C67	K4010033		50 W	
R25	J30356150	Cement 3W	15 Ω	C71	K5017710	)4 Mylar		·
				<del> </del>				
				<del> </del>		VARIAR	LE CAPACIT	OR
		POTENTIOMETER			V000000	26 YB-250		250 pF
VR1	J60800035	VM11AB06A5M1112	10 kΩB	VC1		16 C134E12	5	
VR2	J62800032	DM10A039A 500 kΩB		VC2	K900000	10 (134212	<u> </u>	
VR3	J62800033	DM10A039A 5 kΩA/5	kΩB		<del>-   ·</del>	TRIMME	R CAPACIT	OR
VR4	J60800043	VM10A592A 5 kΩA		<del></del>	K910000		C 10P x 2	
VR5,6	J60800036	VM10A592A 5 kΩB		TC1	K310000	707   1011111		
VR7	J62800034	DM10A39A 5 kΩB/5	kΩA					
VR8	J60800037					_		
VR9, 10	J60800038					INDUCT	OR	
VR11	J60800039	VM10AB08A 5 kΩB			L002053			
				L1	L00203			
				L2 ·	L10200			
				L3	L10200			
<b> </b>		CAPACITOR		L4	L10200			
		Dipped mica 500 WV		L5, L6	110203	٠٠		
C13, 19, 2	1 K3027627		270 pF	(R9, R10)	L11900	01 EL0710	-251K	250 µH
		(LCQ1727271		L7	L11900			1 mH
C8	K3027633	^ 1	330 pF	L8	L00207			
1		(DM-15-331K		· L9	1.00207	-		
C7	K3027662	• • }	7 620 pF					
		(DM19D621K						
100	K3027905	500 W	/ 1100 pF					
C6	1.002.20	- I						

		TRANSFORCER	<del></del>	T	
T1	L0020544	TRANSFOR ER		<u> </u>	
T2, T3	L0020074	For Service Manuals Contact	<del>-  </del>	-	
12, 13	£0020074	A A A TIMITED AND THE HAND ALL DETIVIOUS		1	MULTI JACK
		8 Cherry tree Ed. Ottimos	МЈ1	P4090001	121S-10B-105A
		-1. A4044 25(604 Fax:- ()) 644-332307	MJ2	P4090007	220D-20B-205A
		Email:- enquiries@mauritron.co.uk	млз	P4090002	121S-14B-105A
	<del> </del>	METER		1.05000	
M1	M0090002	Y-45-02			
141 1	W10030002	1-43-02			
<del></del>				:	PLUG
			P1 .	P1090079	5047-12A (with wire T9201410B)
	<u></u>	SPEAKER	P2	P1090080	5047-13A ( " T9201300D)
CD1	M4000005	SA-92Y 4 Ω 3 W	P3	P1090082	5047-15A ( " " T9201310D)
SP1	M4090005	5A-921 432 3 W	P4	P1090082	5047-19A
			P5	P1090082	5047-15A (with wire T9201330C)
	ļ		P6	P1090075	5047-08A
	ļ	DOWER TO A VOCORNER		P1090073	5047-05A (with wire T9201350A)
DT1	1.2020020	POWER TRANSFORMER	P7	P1090072	5047-08A
PT1	L3030028	52-74	P8 P9	P1090082	5047-12A ( " " T9201310C)
	<del> </del>	<u></u>	P10	P1090079	5047-16A
	<del> </del>		P10	P1090083	5047-03A (with wire T9201420A)
		RELAY	P18 P11, 14, 22	P0090045	SQ4052
RL1	M1100004	FRL-263 D012/04CS01	P15	P0090002	SI5908
RL2	M1190004 M1090002	MX2P	P16	P0090002	S1-7502
KL2	W1090002	MAZI	P19	P1090070	
	<del> </del>		P20	P1090070 P1090075	5047-03A
	<del> </del>		P21	- }	5047-08A
		RELAY SOCKET	F21	P0090075	P-7015
RLS1	M1490010	263H204	<del></del>		FUSE
RLS2	M1490001	PX08	F1	Q0000005	5 A (100V-117V)
				Q0000004	3 A (200V-234V)
				1 2000001	
		SWITCH			
S1	N0190070	#250041 (SRS)			FUSE HOLDER
S2	N0190071	#250044 (RS2-4-11)	FH1	P2000001	SN1001 #2
S3 *(Lot 1-7)	N0190025	ESR-E485R20	FH2	P2000003	F3265
S3 *(Lot 8 →)	N0190037	ESR-E486R20		1	
S4, 5	N7090005	WD9223			
	1				PILOT LAMP
		COOLING FAN	PL1	Q1000026	M1041.5.9 (BF311-04071A)
FAN1	M2090001	2SB10A	PL2-5	Q1000033	K0252-6-8 (BQ054-32732B)
		RECEPTACLE			
J1	P1090004	SG7814		Q5000010	Thru terminal FT-SM1
J3	P1090134	SG7627		Q4000002	" A339 (HV)
J2	P0090011	FM144S		Q6000042	Terminal block ML-3182 20P
14	P1090033	D6-701B00		Q6000004	Term nal board 1L2PS (2-0)
J.5	P1090075	5047-08 (with wire T9203200)		Q6000007	" 1L3PS (2-0-1)
J6	P1090014	S17501-1		Q6000	" 1L5PS (4-0-1)
37	P1090028	M-BR-06B		Q6000003	" 1L2PS (1-0-1)
J8	P1090040	SA607B00		Q6000008	" 1L3P (3-0)
J9-14, 18	P1090025	STR-01			" 1L3PS (1-0-2)
J15	P1090005	SG-8050			
J16	P1090045	AC9-PF			
J17	P0090047	QS-DB6-ML			
J19	P1090111	J-7015		·	



···	****	LED B BOAF D * 1	***	1		CAPACITOR	· · · · · · · · · · · · · · · · · · ·
PB-1390	F0001390	P.C. Board		C138	K02179003	Ceramic 50WV CH	2 pF
09	G2090060	GD4-203-SR1		C106	K02172040	,, ,, ,,	4 pF
	<u> </u>			C125, 126	K00175680	" " SL	68 pF
	1			C103	K00175101	" "	100 pF
				C102, 104,	K13170103	" "	$0.01~\mu F$
				116, 119-	ļ		
				121, 130,	İ		
<del></del>				131, 135,	ļ		
				140			
	-			C101, 105,	K13170473	,, , ,,	0.047 μF
	В	F UNIT		107-115,			
Symbol No.	Parts No.		ription	117, 118,			
PB-2154	F0002154	Printed Circuit Boa		122-124,			
A D 2134	C0021540	P.C.B. with compo		127-129,			
	00021340			132-134,			
	-			136, 137,			
	<del></del>	IC, FET & TRANS	TISTOR	139			
2102	C2000125	IC (Ring Module)				TRIMMER CAPACITOR	
Q102	G2090135		3SK40M	TC101		ECV-1ZW 10 x 40	10 pF
Q106	G4800400M			10101	17100017		
Q101	G4800510C		3SK51-03	+		INDUCTOR	
Q103	G3090019		J310	L107	L0020491		0.32 μΗ
Q104, 105	G3324070	TR :	2SC2407	L107	L1190033	FL5H-820K	82 μH
	<u> </u>			L108, 112	L1190016	FL5H-101K	100 μΗ
	-			105, 106,	E1170010	2511 10111	,
				<del></del>	,		
		DIODE		113, 114 L104, 109,	L1190020	FL5H-151K	150 μΗ
D110	G2010070	Ge 1S10		111	21170020	. 2011 1011	
D103, 104	G2015550	Si 1S15		L101, 110,	L1190038	FL5H-271K .	270 μH
D101, 102,	G2090027	" 1SS5	3		11190038	TESH Z/TR	2.0,
105-109				115			
						TRANSFORMER	
				7101 102	L0020788A	THANSFORMEN	
	_				L0020788A		
		RESISTOR		T104	L0020221	JACK	
R122, 131,	J00245479	Carbon film ¼W	VJ 4.7 Ω	J101-103	P1090018	SQ-3081	
R109, 110,	1	,,	" 10 Ω	3101-103	11070018	50 3001	
115, 116,					010	FIX UNIT	
124, 125						Descriptio	
R135	J00245560	" " "	" 56 Ω	Symbol No.	Parts No.	NB-FIX unit with comp	
R106, 107,	J00245101	" " "	" 100 Ω		C0019610		ponents
113, 114,		-		PB-1961B	F0001961B	P.C. Board	<u>.</u>
139, 140			<u></u>		<u> </u>		
R108, 117,	J00245121	" "	" 120 Ω			TRANSISTOR	
126				Q201-204	G3303720Y		
R121, 130	J00245151	" " "	" 150 Ω	Q205, 206	G3315830	2SC1583	
R123, 132	J00245221	" " "	" 220 Ω				
R136	J00245331	11 11 11	" 330 Ω			DIODE	٠.
R119, 128	J00245561	11 11 11	" 560 Ω	D201-204	G2090029	Ge 1N60	
R105, 111,	J00245102	,, ,, ,,	" 1 kΩ	D205-209	G2015550	Si 1S1555	
112, 120,					<u> </u>		
129						RESISTOR	
R118, 127	J00245152		" 1.5 kΩ	R208,216,224,	J00245101	Carbon film 1/4W VJ	100 Ω
R141	J00245222		" 2.2 kΩ	230,238,239,			
R102	J00245272		" 2.7 kΩ	R204	J00245221	" " " "	220 Ω
			" 5.6 kΩ	R222, 236	J00245471	" " " "	470 Ω
		" " "					540.0
R104, 134	J00245562	ļ		R231-233,235	100245561	" " " "	560 Ω
R104, 134 R138	J00245562 J00245103	,, ,, ,,	" 10 kΩ	R231-233,235 R206,215,221,		<del> </del>	1 kΩ
R104, 134 R138 R137 R103, 133	J00245562	, , , , , , , , , , , , , , , , , , ,	" 10 kΩ	R231-233,235 R206,215,221, 234,237		<del> </del>	

210 240	100245472	Carbon film 1/4W VJ 4.7 kΩ			RESISTOR	
	J00245472 J00245562	" " " 5.6 kΩ	R323	J00245100	Carbon film ¼W VJ	10 Ω
	J00245362 J00245103	" " " 10 kΩ	R331	J00245680	<i>n</i>	68 Ω
' ' '	300243103	10 1/42	R301, 303,	J00245101	<i>11 11 11 11</i>	100 Ω
214,225,226	J00245153	" " " 15 kΩ	305, 307,			
	J00245223	" " 22 kΩ	309, 311,			į
		" " " 68 kΩ	313, 315,			
217	J00245683		317, 332,			
		CAPACITOR	333	1		
201,216-218		Dipped mica 50WV 330 pF	R322, 324,	J00245221	<i>11</i> 11 11 11	220 Ω
	K30176331	" " 470 pF	327, 328			
	K30176821	" " 820 pF	R319, 334	J00245152	" " " "	1.5 kΩ
		Ceramic 50WV NPO 15 pF	R329, 330	J00245222		2.2 kΩ
206, 203	K00179005	" " SL 20 pF	R302, 304,	J00245103	<i>n</i>	10 kΩ
206	K00175003	" " 100 pF	308, 310,			
202,203,205,	K13170103	" 0.01 μF	312, 314,			
211,212,221,	12170103		316, 318,			
			321, 325,	1		
225-227,		·	326			
229-233	K13170473	" 0.047 μF	R306	J00245153	,, ,, ,, ,,	15 kΩ
2207,210,213,	K131/04/3	0.017	R320	J00245333		33 kΩ
215,219,220,				<del> </del>	POTENTIOMETER	
223,224,228,			VR301	J50710502	V10K-8-1-2	5 kΩB
237	K40170105	Electrolytic 50WV 1 μF	+	1	CAPACITOR	
C214	<del></del>	" 10WV 4.7 μF	C335	K30176271	Dipped mica 50WV	270 pF .
C238	K40140475	10177 7.7 192	C331	K30176331	· · · · · · · ·	330 pF
	<del> </del>	TRIMMER CAPACITOR	C311, 315,	K30176561	" " "	560 pF
FC201 202	K91000016	ECV-1ZW 50 x 32 50 pF	319			
rC201, 202	VATOOOOTO	10 V-12 W 30 X 32 30 PI	C323, 327	K30176680	11 11 11	680 pF
<u></u>		INDUCTOR	C301, 305,	K13170103	Ceramic "	0.01 μF
1207 200	L1190007	FL-4H 1R8K 1.8 μH	309, 313,			
L207, 208			317, 321,	1		
L204-206	L1190016	FL-5H 101K 100 μH FL-5H 102K 1 mH	325, 329,			
L201-203	L1190017	FL-5H 102K 1 mH	333, 337-			
	<b></b>	TRANCEORAER	339, 341,		1	
	1,0000110	TRANSFORMER	343, 345-			
T201, 202	L0020140	R12-4170	351			
				K13170103	Ceramic 50WV	0.047 μF
	ļ		C302, 304,	121,0103	Columno 50 ii	
			306, 308,			
	7000000	CRYSTAL SOCKET	312, 314,			
XS201	P3090025	S-14 2P	316, 318,			
			320, 322,			
			324, 326,			
			328, 330,			
		MINI CONNECTOR	332, 334,			
J201	P0090037	5048-08A	336, 340,			
J202	P0090038	5048-12A	342, 344		2 26-1	0.001 μF
			C303, 307	K50177102	2 Mylar "	υ.υυι μς
	PF	REMIX UNIT				
Symbol No.	Parts No.	Description			INDUCTOR	1 011
	C0021520	PREMIX unit with components	L302	L1190007	FL4H-1R8M	1.8 μΗ
PB-2152	F0002152	P.C. Board	L303	L1190023	FL5H-220K	22 μH
			L301,304-	L1190017	FL5H-102K	1 mH
		IC, FET, TRANSISTOR	306			
Q303	G1090062	IC SN76514N				· · · · · · · · · · · · · · · · · · ·
Q301	G33192301				TRANSFORMER	
			T301, 302	L0020500		
}			T303, 304	L0020501		
			T305, 306	L0020502		
	1	DIODE	1303,300	L0020302		

()

200 210	T.0020504		XF403	H1100890	i -,	XF	8.9HP		
	L0020504			H1100470		8.91	M20A	•	
	L0020836 _		XF405	H1100900		XF	10GS (	XF-10	HW)
	L0020837				THERM	STO	R		
	L0020838		TH401	G9090003		D-3	3A		
7317,318	L0020839				RESIST				
319	L0020210		R0517, 0518,	J00245220	Carbon f	ilm	1/4W	VJ	22 Ω
		JACK	0520						
(201	P1090018	SQ3081	R410, 411	J01245101	"	**	"	TJ	100 Ω
7301 P301	P0090045	SQ4052	R402,408,422,	J00245101.	"	"	"	VJ	100 Ω
7301	10090043	50,1002	423,437,439,		·				. *
			444,446,463,				*		
			464,469,475,	•		•			
			482,483,497						
	<del> </del>		R419,425,447,	J00245221	"	"	"	"	220 Ω
		FUNIT	451,486,						
Symbol No.	Parts No.	Description	0507,0508						
symbol No.	C0019630	IF unit with components	R0502	J00245331	"	"	"	. "	330 Ω
PB-1963C	F0001963C	P.C. Board		J00245391					390 Ω
רת ו	1 00017030		R443	J00245471	"	<i>"</i>	"		470 Ω
	<b> </b>		R474,480,0522	J00245561	"	"	"	"	560 Ω
			R467, 468	J00245681	"	"			680 Ω
<u></u>		IC, FET, TRANSISTOR		J00245821	,,	"			820 Ω
Q403	G1090063	IC TA7060P	R406,416,428,	J00245102	"		"	"	$1 k\Omega$ .
Q406	G3800190B	FET 2SK19BL	437,440,442,		١.	6	onico I	Manual	s Contact
Q402,413,414,		" 2SK19GR	449,453,457,		M	AURIT	RON TE	CHNICA	IL SERVICES
419, 425			459,462,488,			8 Ch	erry Ti	ee Rd, OX9 4	Chinnor
Q401,405,412,	G4800510C	" 3SK51-03	494,0504,		Tel	1:- 0184	Oxon 44-3516	OA9 4 94 Fax≽	01844-352554
415, 416	1		0506,0515			Email:	- enquiri	es@mai	ritron.co.uk
Q408	G3090019	″ J310 ¥	R429	J00245122		<del>''</del>	<del></del>	<del></del>	1.2 kΩ
Q407, 420	G3105641	TR 2SA564A	R495	J00245152					1.5 kΩ
Q404,409,410,	G3303720Y	" 2SC372Y	R0516	J01245152				TJ VJ	1.5 kΩ
417, 418,		İ	R454,455,458,	J00245222	"	••		٧J	2.2 kΩ
422-424			0510		<del>                                     </del>	<del></del>			2.71:0
Q421	G3305350A	2SC535A	R460	J00245272		<del>.,</del>	<del></del>	-,,	2.7 kΩ
Q411	G3090005	" MPSA13	R401,409,412	•	"				3.3 kΩ
			413,431,456,	•					
			496,0511				,,	,,	4.21:0
			R426,427,476		<del>-</del>				4.7 kΩ
		DIODE	R403,445,478	, J00245562	!   "				5.6 kΩ
D416, 417	G2090029	Ge 1N60	489		<del>,  </del>	<del></del>			6.8 kΩ
D405-408,	G2010070	" (GB) 1S1007	R434, 450	J00245682	<u>'</u>	<del>- ,,</del>	.,	<del></del>	10 kΩ
414, 421	<u> </u>		R404,407,420		' "				10 K24
D401-404,	G2015550	Si 1S1555	421,424,436	1					
409-413,	l	·	471,477,481		ļ				
419, 424			484,485,491	,					
D418	G2022090	Varactor 1S2209	492, 0501,						٠,
D422	G2090040	" FC63	0509, 0512	<del></del>	, "	,,		T.I	10 kΩ
D420, 423	G2090010	Zener WZ090	R433	J0124510	3	,,			
			R470	J0024512	<u> </u>	<del></del>			12 kΩ 15 kΩ
			R415,498,499	J0024515	3   "	•			17 V96
			499	Y	<u>,                                    </u>	,,			27 kΩ
		CRYSTAL	R414	J0024527	3				47 kΩ
X401	H0100431	HC-18/U 19.7475 MHz	R461,472	J0024547	3				-7 / K/26
			0500		4 "	,,			100 kΩ
			R405,465,466		4				150 kΩ
L		1	R493	J0024515	4				100 846
				7 10004510	4 "	**		, ,,	180 kO
		CRYSTAL FILTER	R448,452,48	7, J0024518	4 "	"	,	, ,,	180 kΩ
XF401 XF402 (Optio	H1100860	XF8.9HS	R448,452,48 0503, 0505	7, J0024518 J0024533	4	.,			180 kΩ

R0521	J012452	74   Carbon f	Hm	1/43	1/TT 2701.0	7	<del></del>		
R432	J002456		77	1/41	WTJ 270 kΩ		L002014	5 5.2 μH	#220145
R490	J002451		· ·		VJ 680 kΩ		•		
	J002452	1	77		1 14775	4	-		
R0519	J102465	i			" 2.2 MΩ				
-	3102403	55 60	mposition		GK 5.6 MΩ			TRANS	FORMER
<del></del>						T410	L002015	R12-40	74
<del> </del>						T402,403,40	4, L002014	R12-417	70
					•	407,409,41	3,	` <b> </b>	
VD 401 400			IOMETER			414	1 .		
VR401, 402	J5172310				1 kΩB	T401,406,40	8, L0020141	R12-417	71
VR403, 404	J5172310	•			10 kΩB	415			•
VR405	J5172347	- L			47 kΩB	T405	L0020221		
VR407	J5070550	2 EVN-A1A	-A00B53		5 kΩB	T411	L0020460		
VR406	J5070550	4 EVN-A1A	-A00B55		500 kΩB	T412	L0020209		
						11112	L0020209		
		CAPACIT	OR			<del> </del>			
C477	K3017622				220 pF				
C445, 472	K0217310	0 Ceramic	"	CH	10 pF				
C488, 492	K0617533			UJ	33 pF	140:		MINI CO	NNECTOR
C489	K0617539	0 "		UJ		J401	P0090038		5048-12A
C404,421,432		I			39 pF	J402	P0090039		5048-13A
C487	K0617510	1	···	CH	47 pF	J403	P0090040		5048-15A
C459,464,475		. 1		UJ	100 pF				
C401,405,406		1		СН	100 pF				
411,413,415		3			0.01 μF				
		ł				TP401-412	Q5000011	Wrapping	terminal C
417419470									·
417,419,420	1								•
423,424,428							-		
423,424,428 430,431,433	,								
423,424,428 430,431,433 435,440,442	. ]								
423,424,428 430,431,433 435,440,442, 443,446,448,	. ]						·		
423,424,428 430,431,433 435,440,442, 443,446,448, 451–455,								LE HAUT	•
423,424,428 430,431,433 435,440,442, 443,446,448, 451–455, 460,465,482,						Symbol No		AF UNIT	
423,424,428 430,431,433 435,440,442, 443,446,448, 451–455, 460,465,482, 484–486,						Symbol No.	Parts No.		Description
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493,							Parts No. C0019640	AF unit w	ith components
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497						Symbol No. PB-1964A	Parts No.	AF unit w	ith components
423,424,428 430,431,433, 435,440,442, 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497		,,		0			Parts No. C0019640	AF unit w	ith components
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497	K13170473			0.	047 μF		Parts No. C0019640	AF unit w	ith components
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412,	K13170473	, , , , , , , , , , , , , , , , , , , ,	. "	0.			Parts No. C0019640	AF unit w	ith components
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418,	K13170473	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	. ,	0.	047 μF	PB-1964A	Parts No. C0019640 F0001964A	AF unit w	ith components
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425–427,	K13170473		. "	0.	047 μF	PB-1964A Q503	Parts No. C0019640 F0001964A	AF unit w P.C. Board IC, FET, T	ith components
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425–427, 429,436–438	K13170473		. "	0.	047 μF	PB-1964A  Q503  Q506	Parts No. C0019640 F0001964A G1090077 G1090064	AF unit w P.C. Board IC, FET, T IC	ith components I RANSISTOR
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425–427, 429,436–438, 441,444,447,	K13170473	"	. "	0.	047 μF	PB-1964A  Q503  Q506 ' Q504	Parts No. C0019640 F0001964A	AF unit w P.C. Board  IC, FET, T IC " 1	RANSISTOR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462,	K13170473	,,	. "	0.	047 μF	PB-1964A  Q503  Q506  Q504  Q502	Parts No. C0019640 F0001964A  G1090077 G1090064 G1090100 G1090086	AF unit w P.C. Board  IC, FET, T IC " 1" 5	RANSISTOR MC3403P (μPC324C) MC14024B
423,424,428 430,431,433 435,440,442 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425–427, 429,436–438 441,444,447, 457,458,462, 463,468–471,	K13170473	-	. "	0.	047 μF	Q503 Q506 ' Q504 Q502 Q501	Parts No. C0019640 F0001964A G1090077 G1090064 G1090100	IC, FET, T	TRANSISTOR MC3403P (μPC324C) MC14024B . SN74LS123N ΓΑ7063P
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495,	K13170473	-	. "	0.	047 μF	PB-1964A  Q503  Q506  Q504  Q502	Parts No. C0019640 F0001964A  G1090077 G1090064 G1090100 G1090086	AF unit w P.C. Board IC, FET, T IC " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B . SN74LS123N TA7063P µPC2002H
423,424,428 430,431,433 435,440,442, 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425–427, 429,436–438 441,444,447, 457,458,462, 463,468–471, 473,474,495, 498	K13170473	-		0.	047 μF	Q503 Q506 ' Q504 Q502 Q501	G1090077 G1090086 G1090164	IC, FET, T	TRANSISTOR MC3403P (µPC324C) MC14024B . SN74LS123N TA7063P µPC2002H NJM78L05
423,424,428 430,431,433 435,440,442, 443,446,448, 451–455, 460,465,482, 484–486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425–427, 429,436–438, 441,444,447, 457,458,462, 463,468–471, 473,474,495, 498	K13170473	-	· 11		047 μF	Q503 Q506 ' Q504 Q502 Q501 Q505	G1090164 G1090164 G1090164 G1090164 G1090164 G1090164 G1090120 G3800190G	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B . SN74LS123N TA7063P µPC2002H NJM78L05
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467	K13170473 K14179003 K50177103	., Mylar	· ,,		047 μF 0.1 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514	Parts No. C0019640 F0001964A G1090077 G1090064 G1090100 G1090164 G1090120 G3800190G G3105641	IC, FET, T IC " " " " " " " " " " " " " " " " TR 2	TRANSISTOR MC3403P (µPC324C) MC14024B . SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467	K13170473 K14179003 K50177103 K50177223	Mylar	50WV	0	047 μF 0.1 μF 0.1 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515	G1090077 G1090064 G1090100 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730	IC, FET, T IC " " " " " " T T T T T T T T T T T T T	TRANSISTOR MC3403P (μPC324C) MC14024B . SN74LS123N ΓΑ7063P μPC2002H NJM78L05 2SK19GR 2SA564A
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456,	K13170473 K14179003 K50177103	., Mylar	· ,,	0.0	047 μF  0.1 μF  0.1 μF  0.22 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515	G1090077 G1090064 G1090070 G1090064 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G	IC, FET, T IC " " " " " " TR TR 2 " 2 " 2	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 SK19GR SSA564A SC373 SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493 202,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481,	K13170473 K14179003 K50177103 K50177223	Mylar	50WV	0.0	047 μF  0.1 μF  0.1 μF  0.22 μF  0.47 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508	G1090077 G1090064 G1090100 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483	K13170473 K13170473 K50177103 K50177223 K50177473	Mylar	50WV	0.0	047 μF  0.1 μF  0.1 μF  0.22 μF  0.47 μF	Q503 Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513,	G1090077 G1090064 G1090070 G1090064 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 SK19GR SSA564A SC373 SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498,499,439,456, 466,480,481, 483,434	K13170473 K14179003 K50177103 K50177223	Mylar	50WV	0.00	047 μF  0.1 μF  0.1 μF  0.22 μF  0.47 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508	G1090077 G1090064 G1090100 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479	K14179003 K50177103 K50177473 K70167224 K70127225	Mylar " Tantalum	50WV " " 35WV	0.00	047 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF	Q503 Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513,	G1090077 G1090064 G1090100 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479	K14179003 K50177103 K50177473 K70167224 K70127225	Mylar " Tantalum	50WV " " 35WV	0.00	047 μF  0.1 μF  0.1 μF  0.1 μF  0.22 μF  0.22 μF	Q503 Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513,	G1090077 G1090064 G1090100 G1090100 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479	K14179003 K50177103 K50177473 K70167224 K70127225	Mylar	50WV " " 35WV	0.00	047 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF	Q503 Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513,	Parts No. C0019640 F0001964A  G1090077 G1090064 G1090100 G1090086 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830 G3318150Y	IC, FET, T IC  " " " " " " " TR " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479	K14179003 K50177103 K50177473 K70167224 K70127225	Mylar " Tantalum	50WV " " 35WV	0.00	047 μF  0.1 μF  0.1 μF  0.22 μF  0.47 μF  0.22 μF  1.22 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513, 516	Parts No. C0019640 F0001964A  G1090077 G1090064 G1090100 G1090086 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830 G3318150Y	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR 2SC1383
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 C402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479	K14179003 K50177103 K50177473 K70167224 K70127225	Mylar " Tantalum " Electrolytic	50WV " " 35WV	0.00	047 μF  0.1 μF  0.1 μF  0.22 μF  0.47 μF  0.22 μF  1.0 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513, 516	Parts No. C0019640 F0001964A G1090077 G1090064 G1090100 G1090086 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830 G3318150Y	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR SC1383 SC1815Y
423,424,428 430,431,433 435,440,442 443,446,448, 451-455, 460,465,482, 484-486, 490,491,497 2402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 499,439,456, 466,480,481, 483 434 479 450,476,496	K14179003 K50177103 K50177223 K50177473 K70167224 K70127225 K40120106	Mylar " Tantalum " Electrolytic	50WV " " 35WV " 16WV	0.00	047 μF  0.1 μF  0.1 μF  0.22 μF  0.22 μF  10 μF	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513, 516	G1090077 G1090064 G1090100 G1090086 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830 G3318150Y	IC, FET, T IC " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR 2SC1383
423,424,428 430,431,433 435,440,442, 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 C402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479 450,476,496	K14179003 K50177103 K50177223 K50177473 K70167224 K70127225 K40120106	Mylar " Tantalum " Electrolytic	50WV " " 35WV " 16WV	0.00	047 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.22 μF  10 μF  D  00 μH  D	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513, 516	G1090077 G1090064 G1090100 G1090086 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830 G3318150Y	AF unit w P.C. Board  IC, FET, T IC  " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SA564A 2SC373 2SC1000GR SC1383 SC1815Y
423,424,428 430,431,433 435,440,442, 443,446,448, 451-455, 460,465,482, 484-486, 490,491,493, 494,497 C402,403,407, 408,410,412, 414,416,418, 422,425-427, 429,436-438, 441,444,447, 457,458,462, 463,468-471, 473,474,495, 498 449 461, 467 478 409,439,456, 466,480,481, 483 434 479 450,476,496	K14179003 K50177103 K50177473 K50177473 K70167224 K70127225 K40120106	Mylar " Tantalum " Electrolytic	50WV " " 35WV " 16WV	0.c 0.c	047 μF  0.1 μF  0.1 μF  0.1 μF  0.1 μF  0.22 μF  10 μF  D  00 μH  D	Q503 Q506 ' Q504 Q502 Q501 Q505 Q514 Q515 Q511 Q507, 508 Q512 Q509,510,513, 516	G1090077 G1090064 G1090100 G1090086 G1090164 G1090120 G3800190G G3105641 G3303730 G3310000G G3313830 G3318150Y	AF unit w P.C. Board  IC, FET, T IC  " " " " " " " " " " " " " " " " " "	TRANSISTOR MC3403P (µPC324C) MC14024B SN74LS123N TA7063P µPC2002H NJM78L05 2SK19GR 2SK564A 2SC373 2SC1000GR SC1383 SSC1815Y

D501,518	G2090001	Si 100	1				CAPACITO	₹	•
2001,010	0203002				C513	K30176511	Dipped mica	50WV	510 pF
				· · · · · · · · · · · · · · · · · · ·	C511	K02172050	Ceramic	50 WV CI	1 5 pF
					C522	K02173100	,,	" "	10 pF
					C514	K02179011	"	,, ,,	27 pF
		CRYSTAL			C546-548	K02175390	"	,, ,,	39 pF
X501			0 kHz	#210026	C510,532,534,	K02175101	••	,, ,,	100 pF
		HC-18/U 8986		#210020	555,566				
	H0100421		9 kHz	#210042-2	C533	K02175151	,,	,11 11	150 pF
				#210042-3	C558, 559	K00179020	,,	" SI	240 pF
X504	H0100423	0,70	0.5 KIIZ	#2100423	C512	K06175271	,,	" UJ	270 pF
					C504,519-521,		11	"	0.01 μF
					523,531,535,				
		DEGLOTOD	<del></del>		542-545,				
	T00045560	RESISTOR	1/431/ 37	J 56 Ω	570				
R511	J00245560	Carbon film	1/4W V.			K13170473	,,		0.047 μF
R509,539,557	J00245101	,, ,,	,, ,,	100 34	C509,537,574 C516	K50177102	Mylar	50 WV	0.001 μF
R533, 546	J00245151		,, ,,	. 130 34	C526	K50177472	"	"	0.0047 μF
R503,513,524,	J00245221			$220~\Omega$	C518,529,530,	K50177103	,,	.,	0.01 μF
525	T. 25	n n~~	// //	400.0	572	1201//103			
R512,522,538	J00245471	·····	,, ,,	4/034	C525,539-541	K 50177222	,,	••	0.022 μF
R504,514,520,	J00245102		"	1 kΩ		K50177473	-,,	.,	0.047 μF
523,548,561			,, ,,	0.01.5	C528,556,569,	K30111413			
R515	J00245222	" "	,, ,,	Z.Z K32	573,574	V 5 0 1 7 7 1 0 4	-,,	"	0.1 μF
R534,535,565	J00245272	, , ,,	······································	Z. / K32	C503 C507,517,527,	K50177104	Flootrolytic	.,	1 μF
R510.562.569,	J00245332	, ,, ,,		3.3 kΩ	•	K401/0105	Electronytic		1 41
578-580		,, ,,			550,551,560,		!		
R583	J01245472		" TJ		567,568,571	V.40170225	,,	,,	2.2 μF
R501,506,531,	J00245472	" "	" V.	J 4.7 kΩ	C557	K40170225	<del></del>		3.3 μF
536,537,542,		1			C561	K40170335		25 WV	4.7 μF
544,545,549,					C536	K40140475		16 WV	4.7 μF 10 μF
550,563,566,					C505,515,538,	K40126106		10 14 4	10 41
575,576,581		,, ,,	11 1		552,554,564,				
R521,527,532	J00245562	""	,, ,	J.0 K12	565	7/4010/02/			22 μF
R541,568,570	J00245682			0.0 K32	C524,553,563	K40126226	ļ		47 μF
R507,519,529,	J00245103	" "	•	10 kΩ	C508	K40126476 K40126107		.,	100 μF
555,556,558,	ļ	į			C501		<b>-</b>	.,	220 μF
571, 572			-,, ,,		C506	K40126227	,,		470 μF
R517, 551	J00245153	" "	,, ,,	13 K36	C502	K40126477	<del>                                     </del>		
R508,518,528,	J00245223	" "		' 22 kΩ	C562	K40126336	<u> </u>		33 μF
540,554,573		,, ,,	,, ,,		· · · · · · · · · · · · · · · · · · ·	<del> </del>			
R559	J00245393		-,, ,,	33 K20	+		TRIMMER	CAPACITO	)R
R567	J00245473			4 / K36	70501 705	V01000013	ļ	20 x 32	20 pF,
R516	J00245563	" "		J0 K11	TC501-505	K91000013	ECA-17M	20 X 32	20 pr.
R547, 574	J00245104	" "		100 K25	<b></b>	<del> </del>			<u> </u>
R560	J00245154	""	. " "	130 836			INDUCTOR		
R552, 553	J00245224	" "	" '	220 K32	1	Y 1100000	INDUCTOR		22
R526	J00245274	" "	,, ,	210 K16	L502	L1190023	FL-5H 220		22 μH
R564, 577	J00245474	" "	" '	4 /U K20	L501	L1190038	FL-5H 271		270 μH
R582	J00245824	" "	" '	' 820 kΩ	L503-506	L1190017	FL-5H 102		1 mH
R505	J10276229	" comp	osition 1	/2W GK 2.2Ω			ļ		
R502	J32276010	Wire wound	1W	1 Ω		ļ			
*****						<u> </u>	ļ		
							TRANSFO		
	T				T501	L0020209	#	220209	
		POTENTIOM	ETER						
VR501	J51727101	CR-19R		100 ΩΒ					
	<del> </del>	<del>                                     </del>							
	. 1	1					RELAY		
						1	neear		
					RL501	M1190002	FBR211A	O012M	

		MINI CONNECTOR	<u> </u>	<del></del>	CAPACITOR
J501	P0090043	5048-19A	C607	K30176271	<del></del>
J502	P0090040	5048-15A	C603	K30176331	" " " 330 pF
J503	P0090037	5048-08A	C634, 638,	K02175470	<u> </u>
J504	P0090042	5048-05A	642, 646	K021/34/0	Ceramic Cri 47 pr
J505	P0090041	5048-03A		V02175690	" " " 60-5
-	10020041	3048-03A	C626, 630	K02175680	" " 68 pF
			C623	K02175820	82 pr
<del></del>	P0042800	LIEA Y OLDUZ	C619	K02175101	100 pr
· · · · · · · · · · · · · · · · · · ·	R0042800	HEAT SINK	C615	K02175151	130 pr
<del></del>			C611	K02179023	180 pr
· .			C601, 602,	K13170103	" " 0.01 μF
		LOCAL UNIT	604-606,		
Symbol No.	Parts No.	Description	608-610,	1	
	C0021530	PREMIX LOCAL unit with	612-614,	Ì	
		components	616-618,		For Service Manuals Contact
PB-2153	F0002153	P.C. Board	620-622,		MAURITRON TECHNICAL SERVICES
			624, 625,		8 Cherry Tree Rd, Chinnor
			627-629,		Oxon OX9 4QY Tel:- 01844-351694 Fax:- 01844-352554
			631-633,		Email:- enquiries@mauritron.co.uk
		TRANSISTOR	635-637,	1	·
Q601-612	G3303800Y	2SC380TMY	639-641.		
<del></del>			643-645,		
			647-649		
<del></del>		DIODE	1	-	
D601-612	G2015550	Si 1S1555	<del>                                     </del>	-	
					CRYSTAL
			X601	H0100411	HC-18/U 15.9875 MHz
<del> </del>		RESISTOR	X602	H0101480	" 17.9875 MHz
R605, 610,	J00245101	Carbon film ¼W VJ 100Ω	X602	H0101490	" 21.4875 MHz
615, 620,	300243101	Carbon 11111 /411 13 10043	X604	H0102294A	" 24.4875 MHz
625, 628,	1		X605	H0101500	· · · · · · · · · · · · · · · · · · ·
630, 631,					" 28.4875 MHz
636, 637,		•	X606	H0102295A	32.46/3 NITZ
641, 642,			X607	H0101510	33.46/3 MIZ
646, 647,			X608	H0102296A	38.9873 MHZ
	İ		X609	H0101520	42.46/3 MAZ
651, 652,	ļ		X610	H0101530	42.90/3 MITZ
656, 657	700045151		X611	H0101540	" 43.4875 MHz
R632	J00245151	130 14	X612	H0101550	" 43.9875 MHz
R605, 608,	J00245561	,, ,, ,, ,, 560 Ω			
613, 618,					
623			_		TRANSFORMER
R604, 609,	J00245102	" " " 1 kΩ	T601-612	L0020017	
614, 619,					
624, 629,					INDUCTOR
633, 638,			L601	L1190016	FL5H-101K 100 μH
643, 648,				·	
653,658	1		. W. S	SELEC	T SWITCH UNIT
R661-663	J00245222	" " " 2.2 kΩ	Symbol No.	Parts No.	Description
R602, 607,	J00245333	" " " 33 kΩ	2,	C0019660	SELECT SW unit with components
612, 617,			PB-1966C	F0001966C	
622, 627,			1 D-1 700C	1.0001300C	I.C. Dualu
634, 639,			ļ		DIODE
644, 649,			D701	1 (2000000)	
044, 047,			D701	G2090001	Si 10D1
				1	
654,659	V0551555			<del>, ,</del>	
R601,606,	J00245563	" " " 56 kΩ			RELAY
R601, 606, 611, 616,	J00245563	" " " 56 kΩ	RL701	M1190002	RELAY FBR211A D012M
R601, 606, 611, 616, 621, 626,	J00245563	" " " 56 kΩ	RL701	M1190002	
R601, 606, 611, 616, 621, 626, 635, 640,	J00245563	" " " 56 kΩ	RL701	M1190002	
R601, 606, 611, 616, 621, 626,	J00245563	" " " 56 kΩ	RL701	M1190002	

		MINI CONN STOR			TRIMMER CAPACITOR
701	P0090049	50 8-16A	TC801	1, 000000	TSN-100D15 15 pF
			TC802	K91000016	ECV-1ZW 50 x 32 50 pF
					INDUCTOR
			7.001	L0020268	#220268
		FO UNIT	L801		Micro inductor FL-4H 1.8 μH
ymbol No.	Parts No.	Description	L804, 805		" " 250 μH
		VFO assembly 3420	L803, 806	L1190001	230 μ11
	ı	PCB with components	L802	L1190040	" " S4 102K 1 mH
B-1440B	F0001440B	P.C. Board			
· · · · · ·					
					RECEPTACLE
		FET & TRANSISTOR	J801	P1090012	SI-6303-1
1002	G3800190G			_	
				<del> </del>	
2801, 803	G3303720Y		-		
					TERMINAL
				05000005	
			<b>_</b>	Q5000005	Lighthouse type
		DIODE		Q5000011	Wrapping terminal C
0801	G2022360	Varactor 1S2236			
		RESISTOR			
8809, 811	J00245101	Carbon film 1/4W VJ 100 Ω		RE	CT. B UNIT
R807	J00245101	" " 220 Ω	Symbol No.	Parts No.	Description
	J00245222	" " 2.2 kΩ	- Cympon vo	C0019670	RECT. A unit with components
R805, 808		" " " 3.3 kΩ	- PB-1967	F0001967	P.C. Board
R802	J00245332		FB-1907	1 0001707	1.c. bout
R801	J00245103	10 K25			
R803	J00245183	10 837			
R804	J00245223	22 K36			IO TRANSISTOR
R806, 810	J00245104	" " " 100 kΩ			IC, TRANSISTOR
			Q901	G1090162	IC μPC78L12
			Q903	G3104950O	TR 2SA495(O)
		CAPACITOR			
C807	K02173080	Ceramic disc 50WV CH 8 pF	,		
2801	K06173080	" " UJ 8 pF			DIODE
C803	K06175120		D907	G2090001	Si 10D1
		<u> </u>	D901-904	G2090002	" 10D10
C804	K02175180		D901-904 D905, 906	G2090003	" V06B
C805, 814	K02179013		D903, 906	G2090003	Zener WZ061
C808, 818	K02175390	37 pr	אטאַעו	02030007	Zoner 112001
C811	K02179023				
C821, 823	K00175471				
C809,810,812,	K13170103	" " " 0.01 μF			
815,819,820,					RESISTOR
824,826			R908	J01245560	Carbon film 1/4W TJ 56 Ω
UM71UMU	K30176431	Dipped mica " 430 pF	R905	J10276220	" composition 1/2W GK 22 Ω
			R901-904	J10276474	" " 470 kΩ
C813		. 1000 pt		J20339001	Metallic film 2W 0.4 Ω
C813 C802, 822	K30209001		18407		
C813 C802, 822 C825			R907	320339001	Motano IIII 2.
C813 C802, 822	K30209001		K907	320339001	INCOME THE 21
C813 C802, 822	K30209001		R907	320333001	Treatment and a second
C813 C802, 822	K30209001		K907	320339001	
C813 C802, 822	K30209001				CAPACITOR
C813 C802, 822	K30209001	Tantalum 10WV 0.33 μF  VARIABLE CAPACITOR	C901-905	K13170103	CAPACITOR Ceramic 50WV 0.01 µF
C813 C802, 822 C825	K30209001 K70167334	Tantalum 10WV 0.33 μF  VARIABLE CAPACITOR			CAPACITOR  Ceramic 50WV 0.01 µF

1006	V41140220	Electrolytic 25WV 3300 μF	1	[ [	CAPACITOR		
906	K41140338	Electrolytic 25 W V 5500 pr	C1017	K13170473	Ceramic	50WV	0.047 μF
			C1016	K12279003	"	500WV	0.0022 μF
			C1005, 1006,	K12279004		,	0.0047 μF
			1013-1015,				
		RELAY	1013-1013,	1			
L901	M1190003	FRL-264 D012/04CS-01	C1010	K12279002	,,		0.01 μF
					Electrolytic	250WV	10 μF
			C1009	K40240106	",	"	33 μF
	Q5000011	Wrapping terminal C	C1011	K40240336		,,	47 μF
	Q5000004	Test point D	C1012	K40270106	,-	450WV	10 μF
			C1001-1004	K40270100		350WV	22 μF
			C1007, 1008	K40200220		33011 1	
				<u> </u>			
	REC	T. B UNIT					
Symbol No.	Parts No.	Description			W/		
	C0019680	RECT. B unit with components		Q5000011	Wrapping terr	mmai C	
PB-1968B	F0001968B	P.C. Board					
		TRANSISTOR					
Q1003	G3106390	2SA639	de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la	CAPA	CITOR UNI		
Q1003 Q1001	G3107330	2SA733	Symbol No.	Parts No.		Descript	
Q1001 Q1002	G3303720Y	2SC372Y		C0019690	t	l unit wi	th components.
Q1002	033037201		PB-1969A	F0001969A	P.C. Board		
	<del> </del>						
	<del> </del>						
	-	DIODE					
21001 1005	G2015550	Si 1S1555			RESISTOR		
D1004, 1005,	G2013330	31 151333	R1101, 1102	J10276474	Carbon comp	osition l	/2W GK 470 kΩ
1008-1011	62000002	" 10D10					
D1002, 1003,	G2090002	10010					
1012		" 1001			<u> </u>		
D1006, 1007	G2090001	1001			CAPACITO	R	
D1001	G2090081	" SM1-12	01101 1102	K43270003	· · · · · · · · · · · · · · · · · · ·		200 μF
			C1101, 1102	K43270003	1	E-62LW	
					1	L OZD.	<u> </u>
					<b> </b>		
		RESISTOR			ļ		
R1021	J00245681	Carbon film 1/4W VJ 680 Ω					
R1011, 1016,	J00245472	"""" 4.7 kΩ			<u> </u>		
1020	İ						
R1013, 1015	J00245103	" " " 10 kΩ			MMER A U	NIT	
R1014	J00245123	" " " 12 kΩ	Symbol No.	Parts No.		Descrip	
R1017-1019	J00245223	" " " 22 kΩ		C0019700		A unit w	ith components
R1012	J00245563	" " " 56 kΩ	PB-1970	F0001970	P.C. Board		
R1010	J20306562	Metallic film 1W 5.6 kΩ					
R1022	J20306390	" " 39 Ω					
R1022	J20336391	" " 2W 390 Ω					
R1005	J20336471	" " , 470 Ω			CAPACITO		
R1008	J20336222	" " 2.2 kΩ	C1203	K3017627	Dipped mic		270 pF
	J20336222 J20336332	<u> </u>	C1208	K3017639	" "	**	390 pF
R1007	J20336473		C1202	K3017665		,,	650 pF
R1009				K3020900		,,	1000 pF
R1023	J10276474	Caroon composition 72w GK 470 K12	C1201	K3020900		"	1500 pF
				K0217310		50WV	
			C1206	K0217901			" 30 pF
		POTENTIOMETER	C1205			<del></del>	" 82 pF
VR1001	J50708103	V18K3-2 10 kΩB	C1204	K0217582	<u> </u>		02 p1
			·		+		
i .							

		TRIMMER CAPACITOR	C1407	K30276391	Dipped mica 500WV 390 pF .
TC1203	K91000032	B2PY 100	pF C1402	K30276651	""" 650 pF
TC1202	K91000052	B4PY 220	pF C1401	K30279055	" . " 1500 pF
TC1201	K91000033	B7PY 470	pF		
TC1206	K91000013	ECV-1ZW 20 x 32 20	pF		
C1204, 1205	K91000016	" 50 x 32 50			
101201, 1200					TRIMMER CAPACITOR
			TC1404, 140	5 K91000031	B1PY 40 pF
			TC1402, 140		B2PY 100 pF
		INDUCTOR	TC1401	K91000033	B7PY 420 pF
L1201	L0020545	Trap coil #220545 .		<del></del>	
		And the second s			
			*	-	
				BAND WI	DTH CONTROL UNIT
	TRIMM	ER B BOARD	Symbol No.	Parts No.	Description
Symbol No.	Parts No.	Description		C0019720	B.W. CONT. unit with components
	C0019701	TRIMMER B unit with compon	ents PB-1972	F0001972	P.C. Board
PB-1970	F0001970	P.C. Board			
					LED
		CAPACITOR	D1501	G2090060	GD4-203 SRD
C1303	K30176221	Dipped mica 50WV 220	pF		
C1306	K30176391	"""390	pF		
C1302	K30176621	""""620	pF		
C1301	K30209003	""""1500	pF	•	RESISTOR
	K02173080	Ceramic 50WV CH 8	pF R1501	J00245152	Carbon film 1/4W VJ 1.5 kΩ
C1304	K02175680	" " 68	pF		
					POTENTIOMETER
	†	TRIMMER CAPACITOR	VR1501	J50710502	V10K8-1-2 5 k ΩB
TC1303	K91000032	B2PY 100	pF		
TC1302	K91000052				
TC1301	K91000033		pF	·	
TC1306	K91000012		pF		switch ·
TC1304, 1305	K91000016		pF S1501	N4090008	1B0001AC2060
			1.		
		For Service Manuals Contact			
		MALIBITRON TECHNICAL SERVICES	,		·
		8 Cherry Tree Rd, Chinner Oxon OX9 4QY			
		Tol: 01844-351694 Fax:- 01844-352554		DRI	VER BOARD
	1	Email:- enquiries@mauritron.co.uk	Symbol No.	Parts No.	Description
				C0017140	Driver board with components
					(without vacuum tube) ·
			PB-1714A	F0001714A	P.C. Board
N. Harris	TRIM	IER C BOARD			
Symbol No.	Parts No.	Description			
	C0010920	TRIMMER C unit with compo	nents		
PB-1092	F1001092	P.C. Board			VACUUM TUBE
			V1601	G6090002	12BY7A
			·		
		CAPACITOR			
C1406	K30276100	1	) pF		VACUUM TUBE SOCKET
C1405	K30276820	1	2 pF VS1601	P3090022	SB-9403
C1403	K30276221	" " " 220	0 pF		

	1	RESISTOR			CAPACITOR				
R1605	J10276470	Carbon composition 1/2W GK 47 Ω	C1703	K12279001	Ceramic disc 500WV 0.001 μF				
1602, 1604	J10276560	" " 56 Ω	C1704, 1710	K12279002	" " " 0.01 μF				
1603	J10276101	" " " 100 Ω	C1705-1709,	K13170473	" " 50WV 0.047 μF				
1601	J10276473	" " " 47 kΩ	1711, 1712	<u> </u>					
1001			C1701	K31306102	Moulded mica 1kWV 1000 pF				
			C1702	K30273050	Dipped mica 500WV 5 pF				
	-	CAPACITOR							
21601, 1602	K12279002	Ceramic disc 500WV 0.01 μF							
C1603, 1604,	K13170473	" " 50WV 0.047 μF		·	INDUCTOR				
1606	10170773		L1701	L1190020	Micro inductor 150 μH				
C1605	K30279051	Dipped mica 500WV 1000 pF	L1704	L1190039	" " 560 μH				
31005			L1702, 1703	L1020307	RF choke #220307				
			(R1701,1702)						
		INDUCTOR		<u> </u>					
L1601	L1190020	Micro inductor FL5H 150 μH							
L1601 L1602(R1602)	L1020029	#220029	1	Q5000011	Wrapping terminal C				
D1002(1002)	21020027		<del>                                     </del>	<u> </u>					
	Q5000011	Wrapping terminal C							
	Q3000011		<del></del>						
				CLARIFIEF	CONTROL UNIT				
			Symbol No.	Parts No.	Description				
			CLAR.CONT.unit with components						
			PB-1973B	F0001973B	P.C. Board				
	FINA	AL BOARD							
Symbol No.	Parts No.	Description							
	C0017151	Final board with components							
	[	(without vacuum tube)			DIODE				
PB-1715B	F0001715B	P.C. Board	D1801	G2090001	Si 10D1				
			D1802	G2090060	LED GD4-203SRD				
		VACUUM TUBE							
V1701, 1702	G6090001	VACUUM TUBE 6146B			RESISTOR				
V1701, 1702	G6090001		R1803	J00245102	Carbon film 1/4W VJ 1 kΩ				
V1701, 1702	G6090001		R1803 R1804, 1805	J00245152	Carbon film 1/4W VJ 1 kΩ   1.5 kΩ				
V1701, 1702	G6090001		R1804, 1805 R1802	J00245152 J00245332	Carbon film         1/4W         VJ         1 kΩ           """         """         1.5 kΩ           """         """         3.3 kΩ				
V1701, 1702	G6090001		R1804, 1805	J00245152	Carbon film 1/4W VJ 1 kΩ   1.5 kΩ				
	G6090001 P3090024	6146B	R1804, 1805 R1802	J00245152 J00245332	Carbon film 1/4W VJ 1 kΩ   1.5 kΩ   3.3 kΩ				
		6146B  VACUUM TUBE SOCKET	R1804, 1805 R1802	J00245152 J00245332	Carbon film         1/4W         VJ         1 kΩ           """         """         1.5 kΩ           """         """         3.3 kΩ				
		6146B  VACUUM TUBE SOCKET	R1804, 1805 R1802	J00245152 J00245332	Carbon film 1/4W VJ 1 kΩ  """ 1.5 kΩ  """ 3.3 kΩ  """ 4.7 kΩ				
V1701, 1702 VS1701, 1702		6146B  VACUUM TUBE SOCKET  SB-3606	R1804, 1805 R1802 R1801	J00245152 J00245332 J00245472	Carbon film 1/4W VJ 1 kΩ  " " " 1.5 kΩ  " " " 3.3 kΩ  " " " 4.7 kΩ  POTENTIOMETER				
	P3090024	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE	R1804, 1805 R1802 R1801 VR1801	J00245152 J00245332	Carbon film 1/4W VJ 1 kΩ 1.5 kΩ 1.5 kΩ 1.7 kΩ 1.7 kΩ 1.8 kΩ 1.9				
		6146B  VACUUM TUBE SOCKET  SB-3606	R1804, 1805 R1802 R1801	J00245152 J00245332 J00245472	Carbon film   1/4W   VJ   1 kΩ				
VS1701, 1702	P3090024	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE	R1804, 1805 R1802 R1801 VR1801	J00245152 J00245332 J00245472	Carbon film   1/4W   VJ   1 kΩ				
VS1701, 1702	P3090024	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE	R1804, 1805 R1802 R1801 VR1801	J00245152 J00245332 J00245472	Carbon film   1/4W   VJ   1 kΩ				
VS1701, 1702	P3090024	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE	R1804,1805 R1802 R1801  VR1801	J00245152 J00245332 J00245472 J50710501	Carbon film 1/4W VJ				
VS1701, 1702	P3090024	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR	R1804, 1805 R1802 R1801 VR1801	J00245152 J00245332 J00245472	Carbon film 1/4W VJ				
VS1701, 1702 D1701 R1701, 1702	P3090024	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR	R1804,1805 R1802 R1801  VR1801	J00245152 J00245332 J00245472 J50710501	Carbon film 1/4W VJ				
VS1701, 1702 D1701 R1701, 1702 (L1702, 1703)	P3090024  G2090002	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR Carbon composition 1/2W GK 56 Ω	R1804,1805 R1802 R1801  VR1801	J00245152 J00245332 J00245472 J50710501	Carbon film 1/4W VJ				
VS1701, 1702 D1701 R1701, 1702 (L1702, 1703) R1703, 1704,	P3090024  G2090002  J10276560	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR Carbon composition 1/2W GK 56 Ω	R1804,1805 R1802 R1801  VR1801	J00245152 J00245332 J00245472 J50710501	Carbon film 1/4W VJ				
VS1701, 1702 D1701  R1701, 1702 (L1702, 1703) R1703, 1704, 1705	P3090024  G2090002  J10276560	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR Carbon composition 1/2W GK 56 Ω  """100 Ω	R1804,1805 R1802 R1801  VR1801	J00245152 J00245332 J00245472 J50710501	Carbon film 1/4W VJ				
VS1701, 1702 D1701 R1701, 1702 (L1702, 1703) R1703, 1704,	P3090024  G2090002  J10276560  J10276101	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR Carbon composition 1/2W GK 56 Ω  """100 Ω	R1804,1805 R1802 R1801  VR1801  C1801-1803	J00245152 J00245332 J00245472 J50710501 K13170473	Carbon film 1/4W VJ				
VS1701, 1702 D1701  R1701, 1702 (L1702, 1703) R1703, 1704, 1705	P3090024  G2090002  J10276560  J10276101	6146B  VACUUM TUBE SOCKET  SB-3606  DIODE Si 10D10  RESISTOR Carbon composition 1/2W GK 56 Ω  """100 Ω	R1804,1805 R1802 R1801  VR1801  C1801-1803	J00245152 J00245332 J00245472 J50710501 K13170473	Carbon film 1/4W VJ				

		SWITCH			PLUG
SW1801	N4090011	2B0005FC206	P2201	P1090073	5047-06 (with wire T9202430)
			P2202	P1090075	5047-08 (" " T9202440A)
				,	UNTER UNIT (3420)
	LEI	D BOARD	Symbol No.	Parts No.	Description
Symbol No.	Parts No.	Description	PB-2086A	F0002086A	
	C0019740	LED board with components		C0020862	P.C.B. with components
PB-1974A	F0001974A	P.C. Board			
				ļ	- FET & TO MOIST OF
			20014	G1000240	IC, FET & TRANSISTOR IC MSM9520RS
			Q2312	G1090249	" μPA54H
		LED	Q2320	G1090079 G1090299	" μPC7805H
D1901-1906	G2090060	GD4-203SRD	Q2305	G1090299 G4800730	FET 3SK73
			Q2301 Q2321	G3104960Y	
			Q2321 Q2306-2311,	G31045001	
		RECICTOR	2313-2319	031073200	
P1001 1002	101245102	RESISTOR  Carbon film 1/4W TJ 1 kΩ	Q2303 -	G3316740L	" 2SC1674L
R1901, 1902	J01245102	Carbon inin 1/4W 1J 1 KSZ	Q2304	G3318150G	· · · · · · · · · · · · · · · · · · ·
			1 220.		
	<b> </b>				
					DIODE
			D2301-2313	G2015550	Si 1S1555
	LEVE	R SWITCH BOARD			
Symbol No.	Parts No.	Description			
	C0019750	LEVER SW board with components			CRYSTAL
PB-1975A	F0001975A	P.C. Board	X2301	H0102272	HC-18/U 6.5536 MHz
				<u> </u>	
					DECICEOR
			D2212	J00245100	RESISTOR  Carbon film ¼W VJ 10 Ω
		RESISTOR	R2312 R2331, 2334,	J00245330	" " " 33 Ω
R 2006	J01245560	Carbon film 1/4W TJ 56 Ω	2337, 2340,	300243330	33.55
R2005	J01245101	" " " 100 Ω	2343, 2346,		·
R2001	J01245121	120 32	2349, 2340,		· · · · · · · · · · · · · · · · · · ·
R2002	J01245391	" " " 390 Ω " " VJ 5.6 kΩ	R2350	J00245560	" " " 56 Ω
R2008	J00245562 J01245683	" " TJ 68 kΩ	R2308, 2318,	J00245101	" " " 100 Ω
R2004	JU1243003	13 00 832	2320, 2322,		
	<del> </del>	-	2324, 2326,		
			2328		
		SWITCH	R2301	J01245221	" " TJ 220 Ω
S2001-2004	N3090002	SLE62301	R2307, 2311,		
S2001-2004	N3090008	SLE64251	2312		·
	1		R2352	J00245331	
	ı	A CONTRACT OF THE PARTY OF THE		100045471	" " " 470 Ω
			R2351	J00245471	
			R2351 R2317, 2319,		
				J01245102	
			R2317, 2319, 2321, 2323, 2325, 2327,	J01245102	
		DISPLAY UNIT (3420)	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333,	J01245102	
Symbol No.	Parts No.	Description	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333, 2336, 2339,	J01245102	
Symbol No.	Parts No. F0002098A	Description Printed Circuit Board	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333, 2336, 2339, 2342, 2345,	J01245102	
Symbol No.	Parts No.	Description	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333, 2336, 2339, 2342, 2345, 2348	J01245102	"."" ΤJ 1 kΩ
Symbol No.	Parts No. F0002098A	Description Printed Circuit Board	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333, 2336, 2339, 2342, 2345, 2348 R2329, 2332,	J01245102	"."" ΤJ 1 kΩ
Symbol No.	Parts No. F0002098A	Description Printed Circuit Board	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333, 2336, 2339, 2342, 2345, 2348 R2329, 2332, 2335, 2338,	J01245102	"."" ΤJ 1 kΩ
	Parts No. F0002098A	Description Printed Circuit Board	R2317, 2319, 2321, 2323, 2325, 2327, 2330, 2333, 2336, 2339, 2342, 2345, 2348 R2329, 2332,	J01245102	"."" TJ 1 kΩ

2313	J00245103	Carbon film ¼W VJ 10 kΩ					
	J01245473	" " TJ 47 kΩ	<u> </u>				
R2314	J01245104	" " " 100 kΩ	<u> </u>				
R2316	J00245104	" " " VJ 100 kΩ	·				
		CAPACITOR					
C2324	K02179008	Ceramic 50WV CH 20 pF					
C2325	K02175470	" " 47 pF					
C2320	K02175101	Electrolytic 16WV " 100 pF					
C2320 C2301, 2304	K13170102	Ceramic 50WV CH 0.001 μF					
	K13170103	" " " 0.01 μF					
C2302, 2305,	K13170103						
2308, 2309,		·					
2311, 2312,							
2314, 2315,		İ					
2317, 2319,							
2321, 2323,							
2326-2330		Mylar " 0.01 μF					
C2323	K50177103	10 F					
C2322	K71137685	Tuittan					
C2310, 2318	K40120106						
C2313	K40109011			C-DC CONV	ERTER (OPTION)		
C2316	K40129001	" 16WV 330 μF		Parts No.	Description .		
			Symbol No.		TRANSISTOR		
			20001 2002		T20A6 with insulator		
			Q3201, 3202	G3090002	120710		
		TRIMMER CAPACITOR		<b></b>	RESISTOR		
TC2301	K91000030	ECV-1ZW 40 x 53 40 pF		1	Wire wound 1W $3.3 \Omega$		
			R3202	J	Metallic film 5W 220 Ω		
			R3201	J20376221	Metanic init 3W 220 to		
		INDUCTOR					
L2301	L2030068						
					CAPACITOR		
	<del>- </del>		C3202		Metallized paper 250WV 0.047 μF		
		CONNECTOR	C3201	K41140227	Electrolytic 25WV 220 μF		
J2301	P0090051	5048-06A					
J2301 J2302	P0090054	5048-07A					
J2302 J2303	P0090037	5048-08A			CONNECTOR		
P2301, 2302	P0090045	SQ4052	P3201	P0090066	AC9M		
P2303	P1090186	3021-03 (with wire T9201380A)					
P2303	P1090180	3021 03 (1121		T9012720	DC POWER CORD		
	<b></b>			Q0000009	FUSE 20 A		
		For Service Manuals Contact MAURITRON TECHNICAL SERVICES		ACC	ESSORIES		
		B Cherry Tree Rd; Chinnor	Symbol No.	Parts No.	Description		
		Oxon OX9 4QY	Symbol No.	Far (\$ 140.	AC POWER CORD		
		Tel:- 01844-351694 Fax:- 01844-352554 Email:- enquiries@mauritron.co.uk		T0012280A	2 wire, 2 prong plug		
		. Cital. ordanoocia			3 wire without plug		
					3 wire, 3 prong plug (UL)		
					3 wire, 3 prong plug (OL)  3 wire, 3 prong Australian plug		
				T9012484			
					3 wire, 2 prong EU plug		
				P0090065	CONNECTOR PLUG QS-P6FL		
<del> </del>				P0090018	PIN PLUG STP58		
				P0090035	ACC PLUG PA602B04		
1	<u></u>			Q0000005	FUSE (100V-117V) 5A		
		•	1				
				Q0000004	" (200V-234V) 3A		
					" (200V-234V) 3A		

		AMUNI			·*;			<u> </u>	CAPACITOR	<del></del>		
Symbol No.	Parts No.		Des	criptic	on		C2420	K30176331	Dipped mica			390 pF
Sylfibol IVo.	C0020400	AM unit v					C2416	K02175390	Ceramic	"	CH	39 pF
PB-2040	F0002040	P.C. Board		· P			C2417, 2426	K02175101	"		"	100 pF
12 20 .0	-						C2418	K02175151	"	••	"	150 pF
	-	FET & TF	RANSIS	TOR			C2401	K02175221	"	"	"	220 pF
Q2404	G3800190G		2SK19			······································	C2419, 2421-	K13170103	"	"	"	0.01 μF
Q2406	G4800510C	"	3SK51-	-03			2423, 2428,					
Q2405,2406,	G3303800Y	TR	2SC380	TM-Y	Y		2429, 2434,					
2407	1	1					2436, 2437-					
Q2401	G3307320G	"	2SC73	2TM-C	GR		2440, 2445-					
Q2402, 2409	G3318150Y	"	2SC18	15Y			2447 2449	:				
					·		C2425, 2427,	K13170473	"	"		$0.047  \mu \mathrm{F}$
		DIODE					2430-2433,	1	ļ			
D2406	G2090029	Ge.	1N60				2436, 2439					
D2401, 2402,	G2015550	Si.	1S1555	5			C2451	K50177102		"		0.001 μF
2404, 2405	,						C2407	K50177222	"	<del></del>		0.0022 μF
· · · · · ·							C2410, 2415,	K50177103	,,,			0.01 μF
		CRYSTA		0000	2 1 77	· · · · · · · · · · · · · · · · · · ·	2435, 2438,	}				
X2401	H0100423	HC-18/U		8988.	3 kHz		2447, 2449	V50177472	,,	-,,		0.047E
	ļ	RESISTO		· · ·		. ,	C2402 C2414	K50177473 K50177224	· · · · · · · · · · · · · · · · · · ·	**		0.047 μF 0.22 μF
D2441 2457	J00245470	Carbon fi		1/4W	VJ	47 Ω	C2414 C2405, 2450,	K40170105	Electrolytic			1 μF
R2441, 2457 R2455	J00245470 J00245560	<del> </del>	,,	74 11	·,	56 Ω	2453	K40170103	Licentific			1 /
R2433	J00245101	Ļ	,,	,,		100 Ω	C2452	K40140475	,,	25 WV	<del></del>	4.7 μF
2418, 2422,	300243101					100 11	C2406, 2408,	K40126106	"	16 WV		10 μF
2425, 2432,							2409, 2424,					
2434, 2447							2454					
R2406, 2423	J00245331	,,	,,	"	,,	330 Ω	C2446	K40126476	.,	"		47 μF
R2445, 2452	J00245471	,, ,	,,	**	••	470 Ω	C2403	K40126107	",	"		100 μF
R2409, 2419,	J00245102	''	,,	••	"	1 kΩ	C2413	K40126227	"	",		220 μF
2435, 2436,		1								•		
2438-2440		1							TRIMMER (	APACI	TOR	
							TC2402	K91000012	I	10 x 3	2	10 pF
R2437	J01245102	"	,	"	TJ	1 kΩ	TC2401	K91000013	"	20 x 3	2	20 pF
R2431	J00245272		••	"	VJ	2.7 kΩ						
R2401, 2410,	J00245332	"	,,	"	"	3.3 kΩ			INDUCTOR			
2453, 2456							L2401, 2403	L1190016	FL5H-101K			100 μΗ
R2454 .	J01245332		,,	"	TJ	3.3 kΩ	L2402	L1190017	FL5H-102K			1 mH
R2404	J00245392		··	"	VJ	3.9 kΩ	<u> </u>	<u> </u>				
R2420,2429	J00245472	<u> </u>	,, <u> </u>	<i>"</i>	.,	4.7 kΩ	,	1 00000111	TRANSFOR	MER		
R2442, 2444	J00245562		,,	···	<u>"</u>	5.6 kΩ	T2401	L0020141	R12-4171			
R2402, 2424,	J00245103				••	10 kΩ			0011117070			
2446,2449,2458	<del></del>	ļ.,,	,,	-,,		1210	12401 2404	B1000016	CONNECTO			
R2407	J00245123	<u> </u>	,,	-,,		12 kΩ	J2401, 2404	P1090016		SQ305		
R2405, 2433 R2430	J00245153	<u> </u>		···	<del>''</del>	15 kΩ 18 kΩ	J2402 J2403	P0090041 P0090037		5048-0		
R2430 R2443, 2450	J00245183 J00245223	<u> </u>	<del>,,</del>		,,	22 kΩ	P2401	P0090037		P-701		
R2443, 2430	J00245273	1	,,	,,	•	27 kΩ	1 2701	10030013	<del> </del>	1.101.		
R2408, 2412,	J00245273 J00245333	<u> </u>	<del>,,</del>	•••		33 kΩ	+	Q5000011	Wrapping ter	minal (	]	4.
2421	300243333					JJ R45		<del></del>	P.C.B. suppo			
R2416	J00245393		,,	,,	••	39 kΩ	<del>                                     </del>	DTULUJTUD	L.C.D. Suppe			
R2410	J00245563	,,	,,	••	• • • • • • • • • • • • • • • • • • • •	56 kΩ	<del></del>	<del> </del>	1			
R2427	J00245683	"	,,	"	••	68 kΩ	<del></del>	<del> </del>				
R2417, 2426,	J00245104	····	,,	,,		100 kΩ	<del> </del>		<del>                                     </del>			
2451	300243104					100 100			<del> </del>			
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TH2401	G9090003	THERMI		D33/	<u> </u>							