

 **KENWOOD**

**HF
TRANSCEIVER**

TS-930S



The TS-930S is a superlative, high performance, all solid-state, HF transceiver capable of operation in the SSB, CW, FSK, and AM modes on all Amateur 160 through 10 meter bands. It incorporates an excellent general coverage receiver with an exceptionally high dynamic range (100 dB typical on 20 M, CW bandwidth) having continuous coverage of all frequencies from 150 kHz through 30 MHz. Keyed to the exacting requirements of the DX and contest operator, the TS-930S provides a variety of the most useful performance features, including new, innovative, interference rejection circuits, such as SSB Slope tuning, CW VBT (variable bandwidth tuning), IF notch filter, CW pitch

160—10 METER AMATEUR BANDS, PLUS 150 kHz—30 MHz GENERAL COVERAGE RECEIVER

- The TS-930S covers all Amateur frequencies from 160 to 10 meters, including the new WARC 30, 17, and 12 meter bands, and its general coverage receiver provides reception on any frequency from 150 kHz to 30 MHz. Its transmit and receive modes of operation include SSB, CW, FSK, and AM.
- Selection of a specific Amateur band may be speedily and efficiently accomplished by the touch of a single band access key, one of which is provided for each of the Amateur bands below 10 meters, and two of which are provided for the 10 meter band. An UP/DOWN 1 MHz-step band switch allows easy access to all frequencies in the general coverage area from 150 kHz to 30 MHz. Each of the two digital VFO's is continuously tunable from band to band across the full coverage of the transceiver.
- The TS-930S uses a new, innovative, quadruple conversion, digital PLL synthesized circuit providing a 1st IF of 44.93 MHz, a 2nd IF of 8.83 MHz, a 3rd IF of 455 kHz, and a 4th IF of 100 kHz. This recently developed KENWOOD conceived digital PLL circuit provides superior frequency stability and accuracy, since only the fundamental crystal oscillator determines these parameters.

WIDE RECEIVER DYNAMIC RANGE

The TS-930S receiver section greatly surpasses contemporary receiver

designs to meet the stringent demands of the DX and contest operator. The use of dual 2SK125 junction-type FET's in a parallel RF amplifier circuit, followed by two 2SK125's each, in the 1st balanced mixer and push-pull buffer amplifier, plus a 2nd balanced mixer circuit, results in outstanding two signal characteristics accompanied by a substantially improved noise floor level. Typical two-tone dynamic range performance for the TS-930S receiver section is 100 dB (20 meters, 500 Hz CW bandwidth at sensitivity of 0.25 μ V, S/N 10 dB.), with an overall intercept point of +12 dBm, noise floor level of -138 dBm, and a blocking dynamic range of 139 dB (20 meter, CW bandwidth).

ALL SOLID-STATE, 28 VOLT OPERATED FINAL AMPLIFIER

- The quality of the TS-930S transmitted signal is measurably improved over contemporary designs through the use of a 28 volt power source. Power is supplied to two MOTOROLA MRF-422 RF power transistors ($P_c = 290$ W/each) operating push

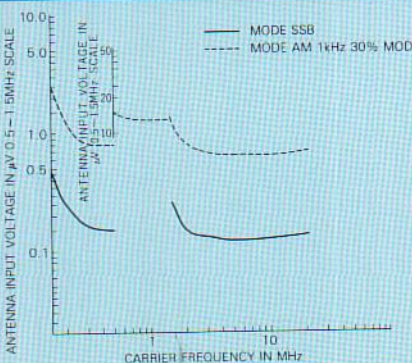
-pull. Total IM distortion, including higher order, is substantially reduced as a result of these improvements.

- Power input to the final is rated at 250 W on SSB, CW, and FSK, and at 80 W on AM.
- The RF power transistors are mounted on a large heat sink, and a cooling fan that is automatically switched on at a pre-determined temperature is provided, to assure maximum heat transfer. Protection circuits that monitor SWR, temperature, and collector current give added protection to the output transistors, should any of those key parameters deviate from normal.
- A built-in SWR/power meter allows the operator to monitor SWR by selection of the appropriate position on the meter function switch. An automatic reading is provided without the need for a calibration adjustment by the operator.

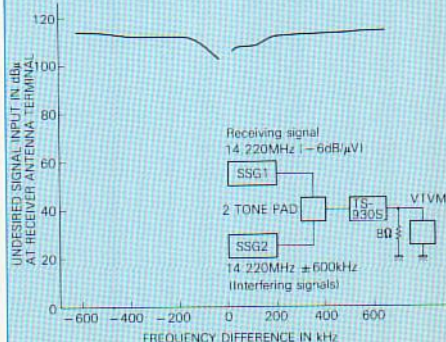
AUTOMATIC ANTENNA TUNER BUILT-IN

The TS-930S is available with the

SENSITIVITY CHARACTERISTIC



RECEIVER SENSITIVITY SUPPRESSION CHARACTERISTIC



control, and audio peak-tuned CW filter. Equally important, the TS-930S design includes dual digital VFO's, eight memory channels, CW full break-in switchable to semi break-in, a unique built-in automatic antenna tuner, and a new higher voltage operated solid-state final amplifier that provides the ultimate in reduction of IM and spurious emissions. The all-in-one design of the TS-930S (transceiver, antenna tuner, and power supply in a single cabinet) makes it the ideal transceiver for use in the ham shack, or when out on a DX-pedition.

The TS-930S may be ordered with the AT-930 automatic antenna tuner installed or available as an option.

AT-930 antenna tuner built-in, or as an option to be added later. Installation of the AT-930 into the TS-930S is quick and easy.

The tuning range is pre-selected automatically with band selection, to minimize tuning time, and circuitry that monitors reflected power automatically switches current to the tuning motor to cause it to tune for the lowest SWR.

The result is a transmitted signal having minimum IM and spurious radiation. Tuning is accomplished almost instantaneously. The tuner covers the Amateur bands from 80 to 10 meters, including the new WARC bands.

It has an impedance matching capability of 20 to 150 Ω , unbalanced. A front panel "AUTO-THRU" switch allows the operator to bypass the tuner, if desired.

CW FULL BREAK-IN

A full break-in capability allows the DX or contest operator to more quickly respond to the calling station. To the "ragchewer", it means a more natural conversation.

The TS-930S supplies this capability

through the use of C-MOS logic IC timing circuitry. Switching is accomplished using a specially constructed, fast acting reed type relay, which also serves to eliminate the distracting sounds typical of a conventional relay.

A front panel switch permits semi break-in operation.

DUAL DIGITAL VFO'S

- Built-in 10 Hz step dual digital VFO's operate independently of each other, and include band information, allowing for ease of split frequency or cross-band operation without the need for a separate VFO.

- Each VFO tunes continuously across the full coverage of the transceiver, with normal tuning (knob rotation) speeds changing the frequency in 10 Hz increments. Rapid tuning knob rotation, in excess of approximately 5.5 to 6.5 revolutions per second, results in increased tuning step size, to permit faster frequency shifts.

A large, heavy, flywheel type knob is provided for improved tuning ease.

- The VFO frequency may also be controlled manually up or down, using an UP/DOWN microphone such as the MC-60 (S8) option.

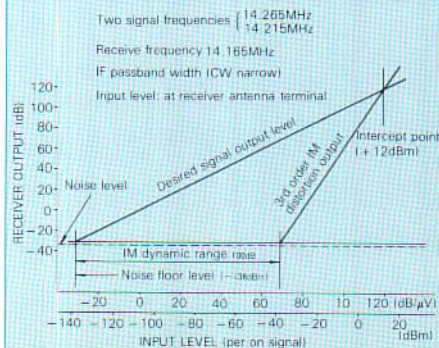
- An "A=B" switch on the front panel allows the operator to quickly shift the "B" VFO to the same frequency as the "A" VFO, or vice-versa, a great advantage in preparing for split-frequency operations.

- A momentary contact "T.F-SET" switch is provided to permit reversal of the transmit and receive frequencies during split frequency operations, simplifying adjustment of the transmit frequency while preventing accidental transmission on top of the DX signal, very useful in DX pile-ups or contests.

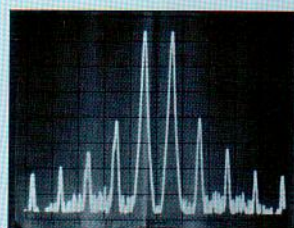
- A "LOCK" switch protects against accidental frequency shift that might occur if the tuning knob were "bumped".

- An "RIT" control, using a rotary encoder provides ± 9.9 kHz receive frequency shift. A "CLEAR" switch resets the RIT frequency to zero.

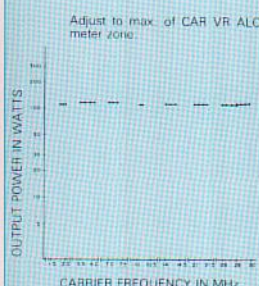
RECEIVER INTERMODULATION DYNAMIC RANGE CHARACTERISTIC



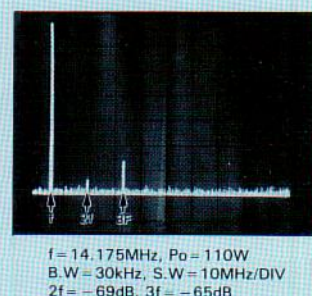
TRANSMITTER 2 TONE IMD CHARACTERISTIC



OUTPUT POWER



HARMONIC EMISSIONS



DX-trao



SPECIFICATIONS

Note: Circuit and ratings subject to change without notice due to developments in technology.

(GENERAL)

Transmitter Frequency Range:	160, 80, 40, 30*, 20, 17*, 15, 12*, 10 meter Amateur bands *Transmission on 30, 17 and 12 meter bands possible with simple modification
Receiver Frequency Range:	150kHz ~ 30MHz
Mode:	A3J (LSB, USB), A1 (CW), F1 (FSK), A3 (AM)
Antenna Impedance:	50Ω, (20 ~ 150Ω with AT-930 antenna tuner installed, 80 ~ 10m Amateur band only)
Power Requirement:	120/220/240V AC, 50/60Hz
Power Consumption:	Max. 510W during transmission 80W during reception
Dimensions:	374(14-3/4)W × 141(5-9/16)H × 350(13-13/16)D mm (inch)
Weight:	18.5kg (40.8lbs.) approx. (with antenna tuner) 16.8kg (37.0lbs.) approx. (without antenna tuner)

(TRANSMITTER)

Final Power Input:	SSB/CW/FSK = 250W AM = 80W
Carrier Suppression:	Better than 40dB
Unwanted Sideband Suppression:	Better than 50dB (with 1.5kHz modulation)
Harmonic Content:	Less than -40dB
Audio Frequency Response:	400 ~ 2,600Hz, within -6dB

Modulation:	SSB = Balanced modulation AM = Low level modulation (IF stage)
FSK Shift Width:	170Hz
Third Order Intermodulation Distortion:	Less than -31dB
Microphone Impedance:	500Ω or 50kΩ (connector switchable)

(RECEIVER)

Circuitry:	Quadruple conversion system
Intermediate Frequency:	1st IF = 44.93MHz 2nd IF = 8.83MHz 3rd IF = 455kHz 4th IF = 100kHz
Sensitivity (at 10dB S/N):	150 ~ 500kHz: Less than 0dBμ (1μV) for SSB, CW and FSK Less than 20dBμ (10μV) for AM
500kHz ~ 1.8MHz:	Less than 12dBμ (4μV) for SSB, CW and FSK Less than 30dBμ (32μV) for AM
1.8MHz ~ 30MHz:	Less than -12dBμ (0.25μV) for SSB, CW and FSK Less than 6dBμ (2μV) for AM
Image Ratio:	More than 80dB (1.8MHz ~ 30MHz)
IF Rejection:	More than 70dB (1.8MHz ~ 30MHz)
Selectivity:	(W = wide, N = narrow filter selection) SSB, CW(W), FSK(W), AM(N): 2.7kHz (-6dB), 4kHz (-60dB) CW(N), FSK(N): Without optional filter = same as CW(W), FSK(W) With optional YG-455C-1 = 500Hz (-6dB), 820Hz (-60dB)

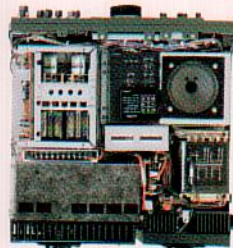
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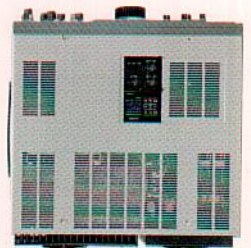
- AM(W): With optional YG-455CN-1 = 250Hz (-6dB), 480Hz (-60dB)
With optional YK-88C-1 = 500Hz (-6dB), 1.5kHz (-60dB)
Built-in 455 kHz filter = 6kHz (-6dB), 18kHz (-50dB)
With optional YK-88A-1 = 6kHz (-6dB), 11kHz (-60dB)
- SSB Slope Tune: High-cut = more than 1,500Hz shift (-6dB)
Low-cut = more than 700Hz shift (-6dB)
(W = wide, N = narrow filter selection)
- CW VBT: 600Hz ~ 2.7kHz (-6dB)
Without optional filter = same as CW(W), FSK(W)
- AMI(W): With optional YK-88C-1 and YG-455C-1 installed 150Hz ~ 500Hz (-6dB)
With optional YK-88A-1 installed 4kHz ~ 6kHz (-6dB)
- Frequency Stability: Within ± 200 Hz from 1 to 60 minutes after turn-on; within ± 30 Hz any 30 minutes period thereafter, at constant temperature.
- Frequency Accuracy: $\pm 1 \times 10^{-5}$ or better (at normal temperatures)
 ± 9.9 kHz
- RIT Variable Range: More than 40dB at 1.5kHz
- Notch Filter Attenuation: More than 1.5W across 8 Ω (at 10% distortion)
- Audio Output Power: More than 1.5W across 8 Ω (at 10% distortion)

• TOP VIEW

• Cover removed

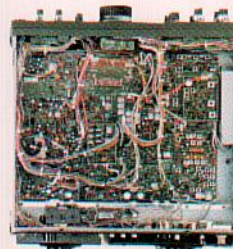


• Top view



• BOTTOM VIEW

• Cover removed



• Rear panel



EIGHT MEMORY CHANNELS

- Each channel stores both frequency and band information, making operation simple and convenient.
- A front panel "VFO-MEMO" switch is provided to allow the operator to operate each of the eight memories as an independent VFO, or as a fixed frequency. When the "VFO-MEMO" switch is in the "VFO" position, the frequency stored in the memory will be transferred to the VFO. Tuning of that frequency, using the main tuning knob, will then be possible. The original memory frequency can be recalled at will. When the "VFO-MEMO" switch is in the "MEMO" position, the frequency stored in the memory will be recalled as a fixed frequency.
- Provision is made for internal battery memory back-up, using 3 "AA" cells (not KENWOOD supplied) having an estimated 1 year life.

SSB IF SLOPE TUNING

Controls are provided on the front panel to allow independent adjustment of either the low frequency or high frequency slopes of the IF passband. This feature provides a greater degree of flexibility in adjusting the IF passband for best rejection of interference, or for best readability under heavy noise or interference conditions.

CW VBT (VARIABLE BAND-WIDTH TUNING) AND PITCH CONTROLS

- In the "CW" mode of operation, the VBT and pitch control circuits are automatically enabled. Using the VBT control, the desired passband width may be selected, within the specified tuning range of the control, to reject interfering signals or minimize noise.
- The CW pitch control shifts the 4th IF passband, at the same time raising or lowering the pitch of the audible beat frequency, useful for avoiding interference or changing to a pitch

(tone) frequency that is easier to copy.

- A "Narrow/Wide" filter selection switch (front panel) is also provided.

IF NOTCH FILTER

A tunable notch filter is provided for operation in conjunction with the 100 kHz IF circuit. The use of the 100 kHz lower frequency results in a sharp, deep, notch characteristic that provides attenuation of approximately 40 dB to the interfering signal. Adjustment of the SSB slope tuning, CW VBT, or pitch controls does not affect the notch frequency.

VARIOUS IF FILTERS (BUILT-IN AND OPTIONAL)

The use of an 8.83 MHz 2nd IF, followed by a 455 kHz 3rd IF promotes excellent selectivity with maximum potential for the use of various filter combinations to further enhance that important performance characteristic. The TS-930S comes with 2.7 kHz SSB, (both 8.83 MHz and 455 kHz IF), and 6 kHz AM, (455 kHz IF), filters built-in, and a choice of easily installed plug-in optional filters is available for the operator who requires maximum selectivity. (See filter chart).

DUAL MODE NOISE BLANKER ("PULSE" OR "WOODPECKER")

A front panel switch allows the operator to select NB-1 or NB-2 for best noise suppression.

The NB-1 position is most effective in suppressing pulse type (ignition) noise. The NB level control adjusts the threshold level of the noise amplifier, to enhance the effectiveness of the noise blanker under specific noise and signal level conditions. The NB-2 position is most effective in suppressing noise of a longer cycle nature, such as the so-called "woodpecker" type noise. The threshold level in this position is factory optimized for maximum effectiveness with minimum modification of the desired signal.

AUDIO FILTER BUILT-IN

For CW operations, a peak-type, tunable audio filter provides additional rejection of noise and interfering signals whose pitch (tone) falls outside the audio filter passband.

FLUORESCENT TUBE DIGITAL DISPLAY

The TS-930S incorporates a fluorescent tube digital display with a unique analog type sub-scale. The analog type subscale indicates tuning across 1 MHz band segments in 20 kHz steps. A separate 2 digit display indicates RIT frequency shift to ± 9.9 kHz. The display also indicates VFO "A" or "B", Memory "ON", RIT "ON" and VFO "LOCK". The use of the fluorescent tube display makes reading easy and minimizes eye fatigue. A switch is provided to allow dimming the display and meter if desired.

RF SPEECH PROCESSOR

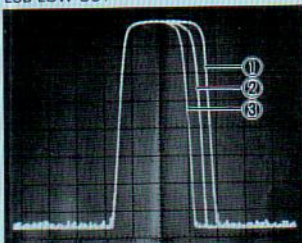
The TS-930S employs speech processing circuitry based on RF clipping techniques. A marked improvement in the intelligibility threshold is attainable, depending on the positions of the separate front panel "IN" and "OUT" controls. A higher average "talk-power", plus improved intelligibility makes for outstanding DX performance.

AC POWER SUPPLY BUILT-IN

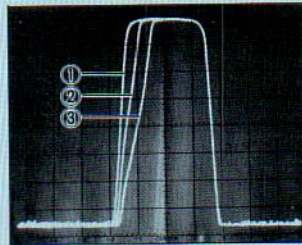
The supply utilizes a power transformer having a special core assembly, with inherent, self-shielding characteristics, and high efficiency, as well as relatively compact design. A separate fan devoted exclusively to power supply cooling is automatically switched on or off, as necessary, to maintain proper operating temperatures. A 3 position AC power selector switch is provided on the bottom, right rear corner for the selection of 120, 220, or 240 V AC (operates on AC only).

SSB SLOPE TUNE

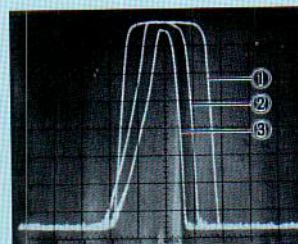
LSB LOW CUT



LSB HIGH CUT

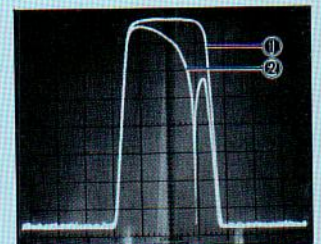


CW VBT



- 1 Maximum bandwidth
- 2 3 Frequency response of the IF stage whose bandwidth is reduced by CW VBT

NOTCH



- 1 IF passband
- 2 Frequency response when the NOTCH filter is ON

OTHER CIRCUITS

● SSB Monitor Circuit

A built-in circuit monitors the IF section during SSB transmissions, allowing the operator to check on his audio quality and the effectiveness of the speech processor.

● RF Attenuator

Provides attenuation, in 3 steps, of

10, 20, or 30 dB.

● VOX

The VOX gain, VOX delay, and Anti-VOX controls are located on top of the cabinet beneath a small, sliding panel.

● 100 kHz Marker

A 100 kHz marker signal is provided. The switch is located on top of the cabinet under the sliding panel.

IF FILTER COMBINATIONS

Mode switch	NAR-WIDE filter switch	8.83MHz IF	455kHz IF	Overall	SSB SLOPE TUNE	CW VBT	AF TUNE *2	NOTCH	Notes
SSB	WIDE or NARROW	3kHz	3kHz	2.7kHz	HI-CUT, Shifts 1,500Hz LOW-CUT, Shifts 700Hz	—	—	YES	
CW/FSK	WIDE	3kHz	3kHz	2.7kHz	—	600 ~ 2.7kHz	YES	YES	
	NARROW *1	(YK-88C-1) 500Hz	(YG-455C-1) 500Hz	500Hz	—	150Hz ~ 500Hz	YES	YES	Filter combination for CW VBT
3kHz		(YG-455CN-1) 250Hz	250Hz	—	*3	YES	YES	For more narrower pass-bandwidth	
AM	WIDE	—	6kHz	6kHz	—	—	—	YES	
	NARROW	(YK-88A-1) 6 kHz	6kHz	6kHz	—	4 ~ 6kHz	—	YES	
		3kHz	3kHz	2.7kHz	—	600Hz ~ 2.7kHz	—	YES	
		(YK-88A-1) 6kHz	3kHz	3kHz	—	*3	—	YES	

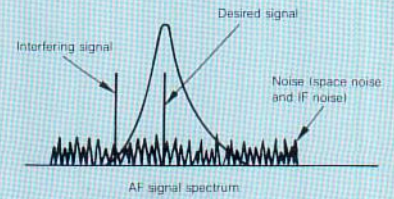
Notes () = Optional filter installed

*1 = Shows recommended optional filter combinations for CW

*2 = AF TUNE on FSK mode not recommended

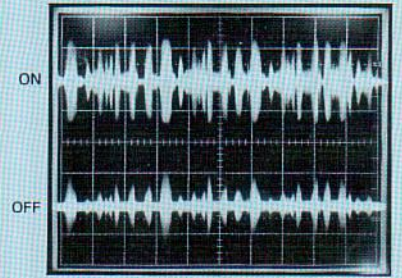
*3 = Although VBT circuit operater, not recommended

AF TUNE

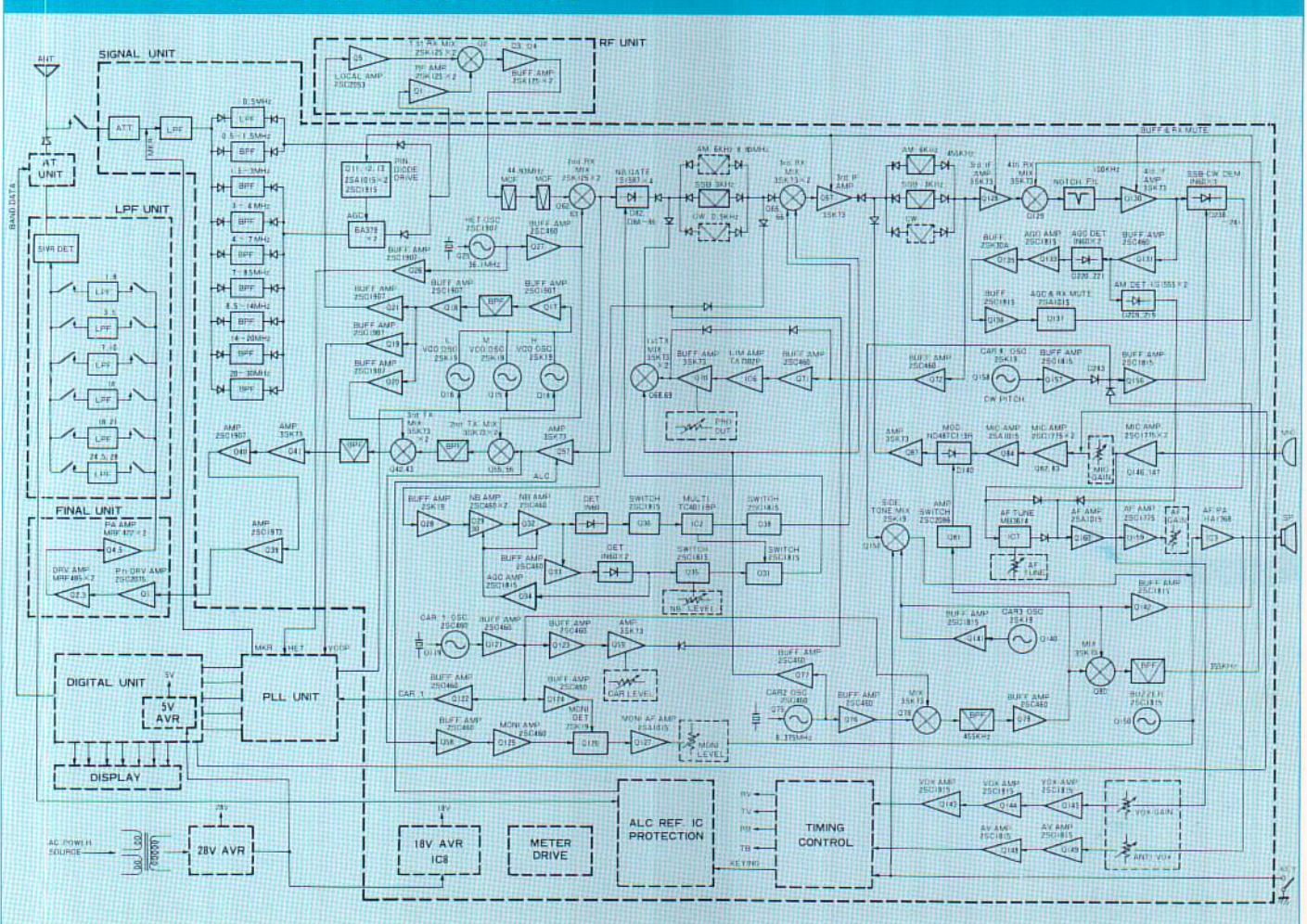


- The AF TUNE function reduces interfering signals and white noise.
- This function should only be used during operation in the CW mode.

HOW SPEECH PROCESSOR WORKS



TS-930S BLOCK DIAGRAM





MC-60A



SP-930

TS-930S

SP-930

External Speaker



The SP-930 external speaker matches the TS-930S HF transceiver. It is a low-distortion speaker with selectable frequency response for high intelligibility in any mode. The frequency response is determined by the built-in audio filters, which are effective in improving signal-to-noise-ratio under certain interference conditions, or when receiving weak signals. On the front panel is a headphone connector, for listening to audio output passed through the filters. Also on the front panel is a switch for selecting either of two audio inputs to the SP-930.

SPECIFICATIONS

•Speaker diameter: 100mm (4.0 inch) •Max. input power: 1.5W •Impedance: 8Ω •Frequency response: 160Hz-7,000Hz •Filter cut off frequency: Low=430Hz (-3dB), High 1=3kHz (-3dB), High 2=1.0kHz (-3dB), High 1 + High 2=730Hz (-3dB) •Filter attenuation: -6dB/Oct. •Dimensions: 180(7.2)W x 133(5.3)H x 287(11.5)D mm (inch) •Weight: 1.9kg (4.2 lbs.) approx.

AT-930

Automatic Antenna Tuner



The AT-930 is an optional automatic antenna tuner that can be installed in TS-930S transceivers which are not equipped with antenna tuners.

FEATURES

•Automatic 2-step motor speed control: The motor speed is automatically reduced when the SWR drops below a certain level to enable precise tuning of the variable capacitors. The TS-930S is the world's first HF transceiver with a built-in automatic antenna tuner. •AUTO-THRU switch disabled during transmission: The AUTO-THRU circuit is disabled during transmission to protect the final transistors in case the AUTO-THRU switch is accidentally operated.

SPECIFICATIONS

•Frequency range: 80-10 meter Amateur bands from 3.5-29.7MHz •Input impedance: 50Ω, unbalanced •Output impedance: 20Ω-150Ω, unbalanced (optimum match) •Input power: 150W max. •Motor stop SWR value: less than 1.2

TL-922/TL-922A

(for U.S.A)

HF Linear Amplifier



The TL-922/TL-922A are class AB₂ grounded grid linear amplifier developed by KENWOOD through advanced high-power technology using two high-performance EIMAC 3-500Z power tubes (optional). It covers all bands 160m through 10m (without the three new Amateur bands) for SSB, CW and RTTY modes of operation.

FEATURES

•Pair of EIMAC 3-500Z high performance transmitting tubes •Class AB₂ G-G circuit •Excellent IMD (intermodulation products distortion) characteristics •Perfect safety protection •Blower turn-off DELAY circuit •Variable threshold level type ALC circuit •Two easy-to-read meters •Attractive matching with KENWOOD HF transceivers

SPECIFICATIONS

•Frequency Range: 1.8-2.0MHz, 3.5-4.0MHz, 7.0-7.3MHz, 14.0-14.35MHz, 21.0-21.45MHz, 28.0-29.7MHz (not on TL-922A) •Mode: SSB CW, RTTY •Drive power: 80W or more for full output •RF input power: SSB=2,000W PEP, CW, RTTY=1,000W DC •Circuitry: AB₂ class grounded-grid linear amplifier •Input impedance: 50Ω •Output impedance: 50-75Ω •Cooling: forced air •Fan motor delay stop time: 140±30 seconds •ALC: negative going adjustable threshold -8V DC max. output (typical) •Tubes: 2 x 3-500Z (optional) •Power requirement: 120/220V 28A, 50/60Hz type, 220/240V 14A, 50/60Hz type •Dimensions: 390(15.6)W x 190(7.6)H x 407(16.3)D mm (inch) •Weight: 31kg (68 lbs.)

•The model TL-922A is available only in U.S.A.

SM-220 Station Monitor



Based on a wide-frequency-range oscilloscope (up to 10MHz), the SM-220 station monitor features, in combination with a built-in two-tone generator, a wide variety of waveform-observing capabilities. The SM-220 provides efficient station operation as it monitors transmitted waveforms, and it also serves as a high-sensitivity wide-frequency range oscilloscope for various adjustments and experiments. (Note: The pan display feature can not be utilised with the TS-930S.)

SPECIFICATIONS

(General) •Power Supply: 120/220/240V AC ±10%, 50/60Hz 20W •Dimensions: 215(8.6)W x 153(6.1)H x 335(13.4)D mm (inch) •Weight: 5kg (11 lbs.) (Transmit Signal Monitor Terminal) •Frequency Range: 1.8-150MHz •Max. Power: 2kW (1.8-54MHz), 100W (150MHz) •SWR: 1.2:1 or less •Deflection Sensitivity: More than 1 div. at 2W input •Attenuator: 6 steps (Trapezoid Waveform Observation) •Frequency Range: 1.8-30MHz •Max. Power at DRIVE terminal: 2-100W •SWR: 1.2:1 or less (Two-Tone Generator) •Oscillator Frequency: 1,000Hz and 1,575Hz •Output Voltage: 10mV/50kΩ (at TWO TONE) (Horizontal Amplifier) •Deflection Sensitivity: More than 300mV/div. •Frequency Response: DC-250kHz or over (EXT GAIN at MAX.); DC-40kHz (EXT GAIN at 1/2) •Input Resistance/Capacitance: 1MΩ (±20%) •40PF or less (SYNC switch at INT) •Attenuator: Fully Variable to 0 •Max. Input Voltage: 100Vp-p (Sweep Circuit) •Sweep Frequency: 10Hz-100kHz (4 ranges, with fine adjustment) •Sweep Linearity: Better than 5% •Sync System: Synchronized sweep, internal negative sync and external sync •Sync Amplitude: Internal: More than 1 div. on CRT, External: More than 2 Vp-p (Vertical Amplifier) •Deflection Sensitivity: More than 20mV/div. •Frequency Response: 2Hz-10MHz (-3dB) •Input Resistance/Capacitance: 1MΩ/40PF •Overshoot: Less than 5% •Attenuator: 1, 1/10, 1/100 and GND/MONITOR (Error between steps: 5% max.) •Max. Input Voltage: 300V (DC + AC peak) or 600Vp-p

YK-88A-1 6kHz AM Filter for 8.83MHz IF



Center Frequency: 8830.0kHz
Selectivity: 6kHz (-6dB), 11kHz (-60dB)
Guaranteed Attenuation: More than 80dB

YK-88C-1 500Hz CW Filter for 8.83MHz IF



Center Frequency: 8830.0kHz
Selectivity: 500Hz (-6dB), 1.5kHz (-60dB)
Guaranteed Attenuation: More than 80dB

YG-455C-1 500Hz CW Filter for 455kHz IF



Center Frequency: 455.0kHz
Selectivity: 500Hz (-6dB), 820Hz (-60dB)
Guaranteed Attenuation: More than 80dB

YG-455CN-1 250Hz CW Narrow Filter for 455kHz IF



Center Frequency: 455.0kHz
Selectivity: 250Hz (-6dB), 480Hz (-60dB)
Guaranteed Attenuation: More than 80dB

MC-60A

(50kΩ/500Ω) Deluxe Desk Top Microphone



Built-in pre-amplifier

MC-42S (500Ω)

UP/DOWN Microphone (Not available in U.S.A. U.S.A. parts No. T91-0316-05)



PC-1

Phone Patch



(Available only where phone patch operation is legal.)

HS-4 (8Ω)

Headphones



HS-5 (8Ω)

Deluxe Headphones



HS-6 (12.5Ω)

Light-weight Headphones



HC-10

Digital World Clock

