KENWOOD

HF
TRANSCEIVER

TS-830S

IF Shift

The variable bandwidth tuning (VBT) and notch circuits, when combined with the IF shift, provide higher adjacent channel selectivity, very useful under crowded conditions. The IF shift circuit is capable of shifting the IF passband toward higher (+) or lower (—) frequencies with the tuned receiver frequency totally unchanged. Hence, an unwanted signal, if present in the IF passband, may be attenuated significantly by shifting the passband in either direction.

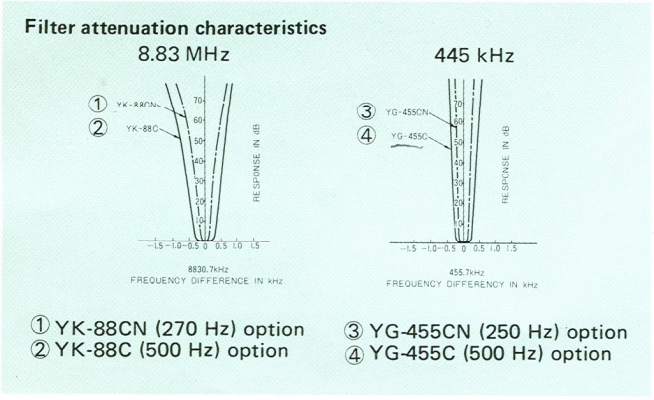
Making use of its high or low cut off passband response in SSB, the desired signal may be adjusted to the desired tone pitch. In CW, likewise, its pitch may be varied by means of a combination of the IF shift and RIT.

Various IF Filter Options

The dual-conversion receiver (8.83 MHz and 455 kHz IF stages) in the TS-830S allow a combination of IF filters to be installed, in accordance with the user's requirements. Various combinations are shown in the chart below.

By incorporating a low-frequency (455 kHz) IF, the attenuation characteristics of the entire IF section are extremely good. Furthermore, 455 kHz filters are very sharp, and either the YG-455C (500 Hz) or YG-455CN (250 Hz) filter may be installed.

Filter attenuation characteristics



① YK-88CN (270 Hz) option
② YK-88C (500 Hz) option
③ YG-455CN (250 Hz) option
④ YG-455C (500 Hz) option

Combination of IF filter

MODE SWITCH			8.83 MHz	455 kHz	Overall Pass-bandwidth	VBT
SSB			2.7 kHz	2.7 kHz	2.4 kHz	500 Hz ~ 2.4 kHz
CW	WIDE		2.7 kHz	2.7 kHz	2.4 kHz	500 Hz ~ 2.4 kHz
CW	NARROW	a	(YK-88C 500 Hz)	2.7 kHz	(500 Hz)	*
CW	NARROW	b	(YK-88CN 270 Hz)	2.7 kHz	(270 Hz)	*
CW	NARROW	c	2.7 kHz	(YG-455C 500 Hz)	(500 Hz)	*
CW	NARROW	d	2.7 kHz	(YG-455CN 250 Hz)	(250 Hz)	*
CW	NARROW	e	(YK-88C 500 Hz)	(YG-455C 500 Hz)	(500 Hz)	150 Hz ~ 500 Hz

Notes: 1. ( ) = optional filter installation.
2. * Although VBT circuit operates, optimum VBT characteristics cannot be expected due to the characteristic differences of 8.83 MHz and 455 kHz filters.
3. The optional 455 kHz filter YG-455C (500 Hz) and YG-455CN (250 Hz) have sharper selectivity, because of low-frequency characteristics.

Built-in Digital Display

A large, six-digit, fluorescent tube display is built into the TS-830S, backed up by an analog subdial. The digital display indicates the actual receive and transmit frequencies on all modes and all bands. This is achieved through a common division of the 10 MHz oscillator frequency for the PLL circuit, calibration circuit, and frequency counter. A Display Hold (DH) switch retains the display frequency while the VFO frequency is varied.

6146B Final with RF NFB

The TS-830S runs 220W PEP (SSB)/180W DC (CW) input and uses two 6146B's in the final amplifier. RF negative feedback provides optimum IMD characteristics for high-quality transmission.

More Flexibility with Optional Digital VFO

The optional VFO-230 digital VFO operates in 20 Hz steps and includes five memories. The digital VFO, memory, and transceiver-VFO frequencies are interchangeable, for optimum operating flexibility in contests, DX chasing, split-frequency operation, and other applications. The VFO-230 covers about 100 kHz above and below each 500 kHz band. It includes a built-in digital display. (The TS-830S also operates with the TS-130 Series external VFOs.)

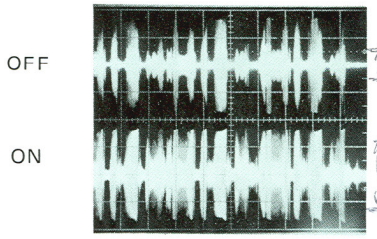
Innovative PLL System

The TS-830S utilizes a new PLL circuit which does not require a crystal element for each band. As shown in the diagram, the VCO frequency is obtained in the PLL circuit by synthesizing the VFO and CAR frequencies, the 10 MHz reference frequency supplied by the counter, and the divided frequency of 500 kHz.

Band changing is accomplished by changing the preset division ratio of the programmable divider in the PLL. This eliminates the need for a heterodyne crystal element for each operating band, resulting in simplification of circuitry, and a marked improvement in overall stability. Also, the VFO operates at the same frequency on each band. The PLL system improves the spurious characteristics during transmission and reception and makes IF shift operation and mono-dial indication available on any mode.

RF Speech Processor

The efficient RF speech processor in the TS-830S, incorporating the 455 kHz IF stages, provides added audio punch and increases average SSB output power, while suppressing sideband splatter. Compression level can be controlled from the front panel and monitored on the meter.



Adjustable Noise-Blanker Level

The built-in noise blanker eliminates pulse-type (such as ignition) noise. A front-panel control adjusts the threshold level of the noise amplifier, to enhance the noise-blanker's effectiveness under various noise and signal levels.

Adjustable Audio Tone

A front-panel tone control adjusts receiver audio frequency response for best readability under various conditions. An additional change in narrow audio frequency response is made automatically when switching to CW mode.

RF Attenuator

The carefully designed receiver-section front end includes a 20 dB RF attenuator for optimum rejection of intermodulation distortion.

RIT/XIT

Receiver incremental tuning (RIT) shifts only the receiver frequency, to tune in stations slightly off frequency. Transmitter incremental tuning (XIT) shifts only the transmitter frequency, when a DX station may be listening "off frequency".

SSB Monitor Circuit

A built-in monitor circuit monitors the IF section while transmitting, to determine audio quality and effect of RF speech processor.

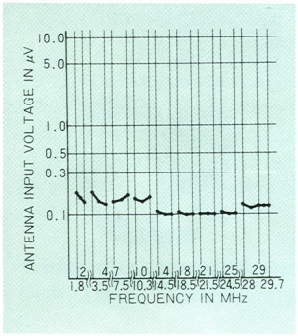
Expanded Frequency Coverage

The TS-830S VFO covers more than 50 kHz above and below each 500 kHz band. The optional VFO-230 remote digital VFO covers about 100 kHz above and below each band, for MARS and other applications.

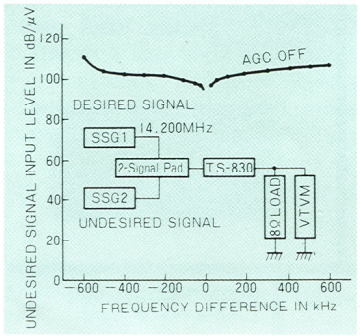
Other Versatile Provisions

- Built-in 25 kHz Marker.
- Built-in AC power supply.
- Built-in VOX circuit for SSB operation and CW semi-break-in operation with sidetone.
- Switchable AGC circuit (SLOW/FAST/OFF).
- Built-in CW audio tone circuit.
- Built-in CW zero-Beat function.
- FIX channel switch.
- Multifunction meter (ALC/IP/RF/COMP/HV).
- LED indicators (RIT, XIT, RF ATT, VFO, FIX, and NOTCH).
- IF OUT-1 and IF OUT-2 terminals for SM-220 Station Monitor.

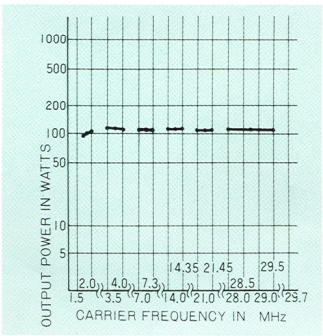
Receiver Sensitivity



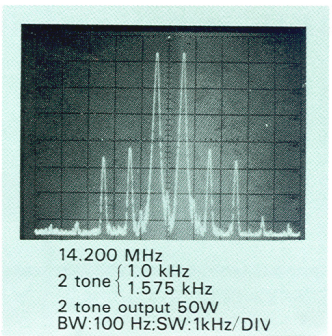
Sensitivity/suppression characteristics



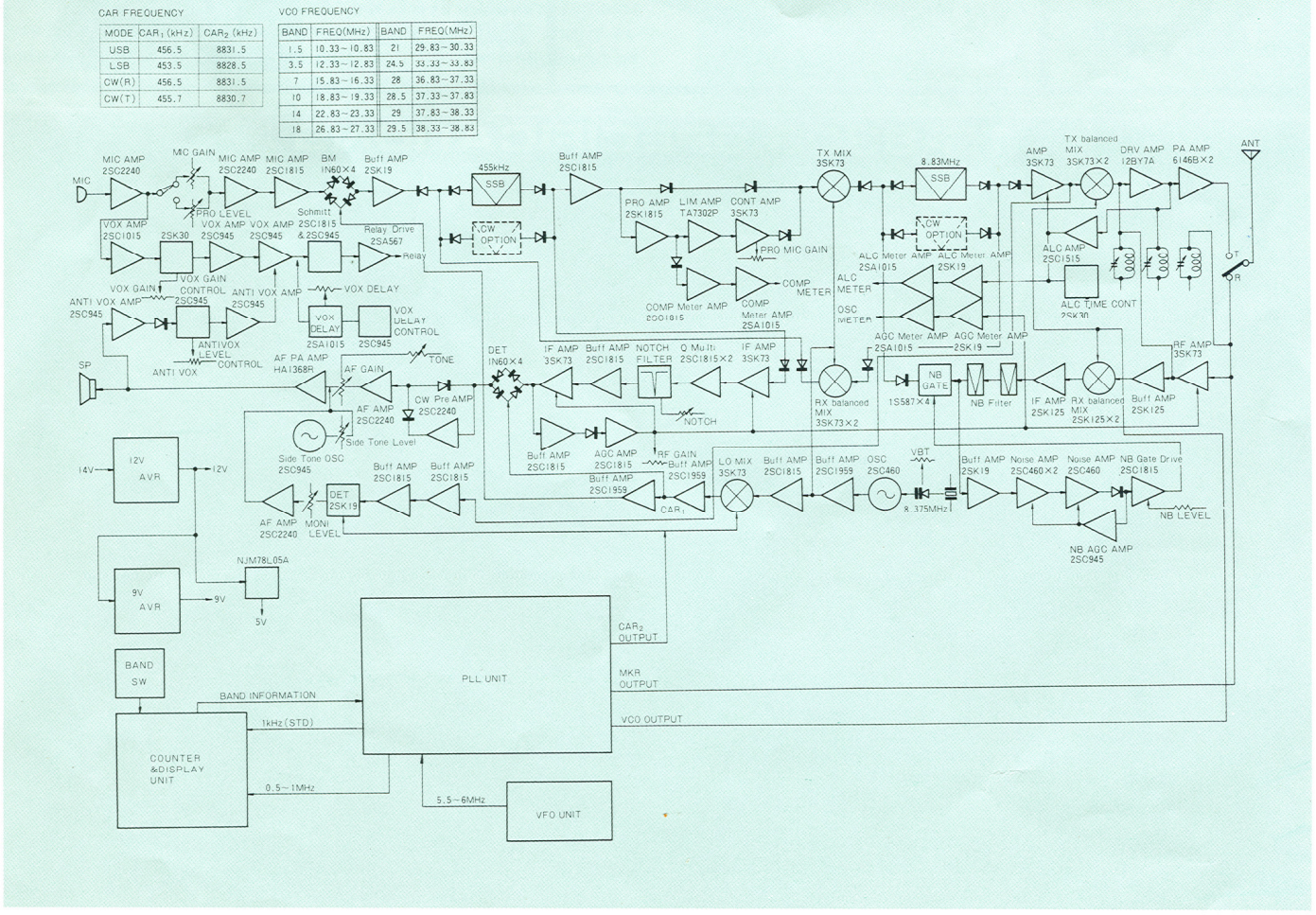
Output Power (CW)



IMD Characteristics



TS-830S BLOCK DIAGRAM



OPTIONAL ACCESSORIES

SM-220
Station Monitor

Based on a wide-frequency-range oscilloscope(up to 10 MHz),the SM-220 station monitor features, in combination with a built-in two-tone generator, a wide variety of waveform-observing capabilities. An optional feature is a unique pan-display capability. 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.

SPECIFICATIONS

(Transmit Signal Monitor Terminal) ● Frequency Range: 1.8–150 MHz ● Maximum Power: 1 kW (1.8–54 MHz), 50W (150 MHz) ● SWR: 1.2:1 or less ● Deflection Sensitivity: More than 1 div. at 2W input ● Attenuator: 6 steps (Trapezoid Waveform Observation) ● Frequency Range: 1.8–30 MHz ● Maximum Power at DRIVE TERMINAL: 2–100W ● SWR: 1.2:1 or less (Two-Tone Generator) ● Oscillator Frequency: 1,000 Hz and 1,575 Hz ● Output Voltage: 10 mV/50 kΩ (at TWO TONE) (Pan Display Unit) ● Input Center Frequency: 3.395 MHz (BS-5), 8.830 MHz (BS-8) ● IF Frequency: 455 kHz ● IF Bandwidth: More than 1 kHz (–6 dB) ● Input Sensitivity: More than 10 μV/div. ● Scan Width: ±20 kHz, ±100 kHz, switchable gain (Horizontal Amplifier) ● Deflection Sensitivity: More than 300 mV/div. ● Frequency Response: DC 250 kHz or over (EXT GAIN at MAX) DC 40 kHz (EXT GAIN at 1/2) ● Input Resistance/Capacitance: 1 MΩ (±20%)/35 pF or less (SYNC switch at INT) ● Attenuator: Fully Variable to 0 ● Max. Input Voltage: 100 Vp-p (Sweep Circuit) ● Sweep Frequency: 10 Hz–100 kHz (4 ranges, with fine adjustment) ● Sweep Linearity: More 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 20 mV/div. ● Frequency Response: 2 Hz–10 MHz (–3 dB) ● Input Resistance/Capacitance: 1 MΩ/40 pF ● 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 600 Vp-p ● Power Supply: 120/220/240V AC ±10%, 50/60 Hz 20W ● Dimensions: 215 (8.6)W x 153 (6.1)H x 335 (13.4)D mm (inch) ● Weight: 5 kg (11 lbs)

OPTIONAL ACCESSORIES

● BS-8 ····· Pan Display for TS-830S/TS-530S/TS-180S/TS-820 series ● BS-5 ····· Pan Display for TS-520S/TS-520SE

KB-1 Deluxe VFO Knob
Matches: TS-530S, TS-830S, TS-820S, R-820, VFO-230, VFO-240

HS-5 (8Ω)
Deluxe Headphones

HS-4 (8Ω)
Headphones

PC-1
Phone Patch

MC-30S (500Ω)
MC-35S (50 kΩ)
Noise-Cancelling Hand Microphone

MC-50 (50 kΩ/500Ω)
Desk Top Microphone

YG-455C
500 Hz CW filter

YG-455CN
250 Hz CW filter

YK-88C
500 Hz CW filter

YK-88CN
270 Hz CW filter

HC-10
Digital World Clock

This clock incorporating a precise quartz and digital display system as well as a built-in microcomputer can also recall and display the starting time of QSO for logging purpose.

Power requirements:
120V AC, 50/60 Hz
Dimensions 217 (8.7)W x 94 (3.8)H x 117 (4.7) D mm (inch)
Weight: Approx. 900g (2.0 lbs.)

TS-830S SPECIFICATIONS

[GENERAL]

Frequency Range:	160m Band	1.8 ~ 2.0 MHz
	80m Band	3.5 ~ 4.0 MHz
	40m Band	7.0 ~ 7.3 MHz
	*30m Band	10.1 ~ 10.15 MHz (10.0 MHz WWV)
	20m Band	14.0 ~ 14.35 MHz
	*17m Band	18.068 ~ 18.168 MHz
	15m Band	21.0 ~ 21.45 MHz
	*12m Band	24.89 ~ 24.99 MHz
	10m Band	28.0 ~ 29.7 MHz
Mode:	SSB/CW	
Frequency Stability:	Within 100 Hz during any 30 minute period after warmup. Within 1 kHz during the first hour after 1 minute of warmup.	
RF Output Impedance:	50Ω ~ 75Ω	
Power Requirement:	120V AC (220V modifiable), 50/60 Hz	
Power Consumption:	Transmit: 295 W Receive: 32 W (with heater off)	
Dimensions:	333(13.3) x 133(5.3) x 333(13.3) mm (inch)	
Weight:	13.5 kg (29.8 lbs)	

[TRANSMITTER]

*Final Power Input:	220W PEP for SSB operation 180W DC for CW operation
Carrier Suppression:	Better than 40 dB
Unwanted Sideband Suppression:	Better than 60 dB
Spurious Radiation:	Better than 60 dB
Audio Input Impedance:	500Ω ~ 50 kΩ
Audio Freq. Response:	400 to 2,600 Hz, within –60 dB

[RECEIVER]

Sensitivity:	0.25 μV at 10 dB S+N/N
Selectivity:	
SSB/CW WIDE:	2.4 kHz (–6 dB), 3.6 kHz (–60 dB)
CW NARROW:	with YK-88C (option) 500 Hz (–6 dB), 1.5 kHz (–60 dB) with YK-88CN (option) 270 Hz (–6 dB), 1.1 kHz (–60 dB) with YG-455C (option) 500 Hz (–6 dB), 820 Hz (–60 dB) with YG-455CN (option) 250 Hz (–6 dB), 500 Hz (–60 dB)
Variable Bandwidth	
SSB with 2.7 kHz filter:	500 Hz ~ 2.4 kHz (–6 dB) continuously variable
CW with optional YK-88C and YG-455C 500 Hz filters:	150 Hz ~ 500 Hz (–60 dB) continuously variable
Notch-filter Attenuation:	Better than 40 dB
Image Ratio:	Better than 60 dB
IF rejection:	Better than 80 dB
Audio Output Impedance:	8 ~ 16Ω
Audio Output:	1.5W (8Ω)

* Will transmit on the new 30, 17, and 12 meter bands. Diodes have been installed to prevent accidental transmission. They may be removed easily when government authorization has been granted for amateur operation.

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

SP-230 TS-830S VFO-230 AT-230

VFO-240

Remote VFO

The VFO-240 remote analog VFO is a valuable, yet affordable station addition for split-frequency operation, temporary QSY and fast return to a net frequency, searching for a clear frequency, and other applications.

FEATURES

● T-F SET switch: allows operator to set transmit frequency quickly; reverses transmit and receive frequency momentarily, to prevent transmitting on wrong frequency during split-frequency operation ● Cross-operation function switch ● RIT control ● MAIN and RIT indicators.

SPECIFICATIONS

● Oscilating Frequency: 5.5—6.0 MHz ● Oscillator Circuit: modified clapp ● Output Voltage: 0.2 V ± 1 dB ● Frequency Stability: Within 100 Hz per 30 minutes after 3 minutes warm-up ● Sold-state Complement: FET; 2, Transistor; 2, Diode; 6 ● Power Source: From TS-830S, TS-530S ● Dimensions: 180 (7.2)W x 133 (5.3)H x 288 (11.5)D mm (inch) ● Weight: 2.4 kg (5.3 lbs.)

VFO-230

Digital Remote VFO

The VFO-230 digital VFO provides maximum efficiency and flexibility for all operating conditions, including split-frequency operation, by combining a 20 Hz step digital VFO with five memories.

FEATURES

● 20 Hz step digital VFO: Provides excellent stability and smooth tuning on CW and SSB ● Five Memories: Frequency can be transferred from VFO (transceiver or VFO-230) to memory or from memory to digital VFO (VFO-230) ● Built-in digital display: Shows digital VFO or memory frequencies. The display range is selected automatically to cover 900.0—599.9 or 400.0—099.9, according to the band. Backed up by analog subdial with 1 kHz divisions. ● Cross-operation flexibility: Easy to operate function switch provides: RECEIVE/TRANSMIT: Main, RMT, Memo (Main: Transceiver VFO or FIX, RMT: VFO-230 digital VFO, MEM: Memory) ● T-F SET switch: Allows operator to set transmit frequency quickly. Reverses transmit and receiver frequency momentarily, to prevent transmitting on wrong frequency during split-frequency operation ● Expanded frequency coverage: About 100 kHz above and below each 500 kHz band for MARS and other applications ● Lock switch: To prevent accidental frequency change ● MAIN, RMT, and MEMO indicators: LEDs show functions in operation ● Capability with TS-830S, TS-530S, and TS-130 Series.

SPECIFICATIONS

● Oscillating Frequency: 5.4—6.1 MHz ● Frequency Stability: 1×10^{-6} 20 Hz (at normal temperature), 3×10^{-6} 20 Hz (0—50°C) ● Output Voltage: 0.2V +3 dB, −1 dB ● Power Requirement: 120 V AC (modifiable to 220 V AC), 50/60 Hz, 13 W ● Dimensions: 180 (7.2)W x 133 (5.3)H x 287 (11.5)D mm ● Weight: 3.1 kg (6.8 lbs.)

AT-230

Antenna Tuner

The AT-230 antenna tuner includes the new three bands and functional features such as a through-line wattmeter, SWR meter and antenna selector switch.
The AT-230 greatly adds to the effectiveness of your station.

SPECIFICATIONS

(ANTENNA COUPLER) ● Frequency Range: 9 amateur bands from 1.8 to 30.0 MHz ● Input Impedance: 50 Ω ● Output Impedance: 10 to 500 Ω, unbalanced ● Through Power: 200 W max. (WATTMETER) ● Type: Through line wattmeter ● Frequency Range: 1.8 to 30.0 MHz ● Measurable RF power: Up to 20/200 W, switched ● Kinds of RF Power: Forward and reflected power, switched ● Impedance: 50 Ω ● Accuracy: Better than ±10% of full scale (SWR METER) ● SWR detection: Toroidal core directional coupler ● Measurable Range: 1.1 to 10 ● Min. Power Required: 4 W (GENERAL) ● Connectors, INPUT: UHF type, 50 Ω ● Connectors, ANT-1: UHF type; ANT-2: UHF type; ANT-3: Wire antennal only; GND ● Dimensions: 180 (7.2)W x 133 (5.3)H x 287 (11.5)D mm (inch) ● Weight: 3.4 kg (7.5 lbs.)

SP-230

External Speaker

The SP-230 external speaker matches the TS-530S 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-230.

SPECIFICATIONS

● Maximum Input (nominal): 2W ● Impedance: 8 Ω ● Frequency Response: 300 Hz to 5 kHz ● Filter Cut off Frequency: Low = 400 Hz/−3 dB, High 1 = 3 kHz/−3 dB, High 2 = 1.5 kHz/−3 dB, High 1 and High 2 = 1.0 kHz/−3 dB ● Filter Attenuation Characteristic: −6 dB/Oct. ● Dimensions: 180 (7.2)W x 133 (5.3)H x 287 (11.5)D mm (inch) ● Weight: 1.8 kg (4.0 lbs)

TL-922A

HF Linear Amplifier

The TL-922A is an HF linear amplifier operating at maximum legal power, and employing a pair of 3-500Z high performance transmitting tubes.

SPECIFICATIONS

● Frequency Range: 160 meter band—1.8 to 2.0 MHz, 80 meter band—3.5 to 4.0 MHz, 40 meter band—7.0 to 7.3 MHz, 20 meter band—14.0 to 14.35 MHz, 15 meter band—21.0 to 21.45 MHz ● Mode: SSB, CW, RTTY ● Drive power: 80 W or more for full output ● RF Input Power: SSB; 2,000 W PEP, CW, RTTY; 1,000 W DC ● Circuitry: AB_2 Class Grounded-grid Linear Amplifier ● Input Impedance: 50 Ω ● Output Impedance: 50 to 75 Ω ● Tubes: EIMAC 2x3-500Z (option) ● Dimensions: 390 (15.6)W x 190 (7.6)H x 407 (16.3)D mm (inch) ● Weight: 31 kg (68 lbs.) ● Power Requirements: 120/240V AC, 50/60 Hz

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