



CR-70

SOLID STATE SYNTHESIZED HF RECEIVER



The CR-70 is a completely solid state HF receiver, providing continuous coverage over the frequency range of 2.0 through 30.0 MHz. By incorporating a unique integrated circuit digital frequency synthesizer, the CR-70 may be tuned over this frequency range in 100 Hz. steps. In addition, the last two decades of the synthesizer may be unlocked and manually tuned over any 10 KHz. segment in the 2 through 30 MHz. frequency range. The modes of reception offered by the CR-70 include independent sideband, upper sideband, lower sideband, AM, CW, or FSK. Automatic frequency control is available as an option for use in applications where a pilot carrier is present. While the CR-70 is normally furnished in a desk top transportable cabinet, it is also available for rack mounting in a conventional 19" rack and requires only 12 1/4" of panel space.

DESIGN FEATURES

The heart of the CR-70 is a recently developed integrated circuit digital frequency synthesizer utilizing a high stability temperature compensated crystal oscillator as the frequency standard. As long as the CR-70 is operated within its temperature design range, the unit is instantaneously on frequency the moment that power is applied. When the CR-70 is incorporated in a large communication system, it may be referenced to an external one megacycle frequency standard if desired.

No band switching is required in the CR-70. The frequency selection switches on the synthesizer automatically activate hermetically sealed reed relays, which select the appropriate receiver coils. By employing hermetically sealed relays in the RF signal path switching circuits, the problems caused by contact corrosion and films are, thus, eliminated and the reliability increased.

Careful attention to front end design minimizes cross modulation problems normally encountered in solid state receivers.

The CR-70 has been designed for simplicity of operation. The operator merely selects the desired frequency on the synthesizer and then tunes the pre-selector to the appropriate frequency range. Push button selection of the metering functions, AGC, audio output, squelch, automatic frequency control, and power provide for ease of operation. A panel mounted loudspeaker with its own audio amplifier enables

local monitoring, while separate amplifiers are provided for the line outputs. In this way, the local monitor volume may be adjusted without affecting the line levels.

An optional feature, which may be incorporated in the CR-70, is automatic frequency control. This circuit permits the receiver to lock on to a received pilot carrier and automatically compensates for any frequency drift occurring in the transmitted carrier. A zero center meter function has been provided to enable the relative frequency drift to be measured on the panel mounted meter. The meter range will measure approximately ± 120 Hz. from the center frequency. In addition, a drift indicator lamp will automatically light when the received signal has drifted beyond the acceptable predetermined frequency tolerances. A signal fade indicator lamp is provided to offer positive notification for the operator when the pilot carrier level drops below the predetermined level for reliable synchronizing of the local oscillator.

The CR-70 represents a significant advance in the design of HF communication receivers. It incorporates the performance features and operating conveniences most often requested by professional communication men. The unit is ideally suited for applications in point-to-point communication service, high seas telephone service, aviation point-to-point service, and in military applications.

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TECHNICAL SPECIFICATIONS

MODES OF RECEPTION:	Independent sideband, USB, LSB, AM, CW, FSK.
FREQUENCY RANGE:	2.0 MHz. through 30.0 MHz.
FREQUENCY CONTROL:	Phase locked integrated circuit digital frequency synthesizer.
FREQUENCY STABILITY:	5 parts in 10^7 (1/2 part-per-million).
FREQUENCY READOUT:	Digital readout from rotary thumbwheel switches.
FREQUENCY INCREMENTS:	100 Hz. steps or continuous tuning over 10 KHz. range.
VFO RANGE:	10 KHz. calibrated to 100 Hz.
VFO DIAL ACCURACY:	Better than 100 Hz. at 22° C.
VFO STABILITY:	Better than 500 Hz. from 0° to 50° C.
TEMPERATURE RANGE:	-25° C to +55° C.
IF BANDWIDTH:	
USB:	Not more than 6 db down at 470 Hz. and 2600 Hz.
LSB:	Not more than 6 db down at 470 Hz. and 2600 Hz.
DSB:	Nominal 6.5 KHz. at -6 db, 20 KHz. at -60 db.
RADIOTELETYPE (RTTY):	Appropriate bandwidth available to meet required frequency shift. (Optional).
UNWANTED SIDEBAND REJECTION:	Greater than -60 db down at 1 KHz.
SENSITIVITY:	1/2 Microvolt will produce a 10 db signal-to-noise ratio on SSB. 3 microvolts will produce a 10 db signal-to-noise ratio at 30% modulation on DSB.
IF REJECTION:	-70 db at 2.0 MHz., increasing to greater than -100 db at 5.0 MHz. and above.
INBAND I M DISTORTION:	Greater than -40 db down.
CROSSTALK:	Greater than -50 db down.
CROSS MODULATION:	When receiving a 30 microvolt desired signal, a 30,000 microvolt signal with 30% modulation, ± 50 KHz. from the desired frequency will produce less than -10 db of cross modulation.
AGC RESPONSE:	Fast attack, slow release. Less than 6 db increase in audio output for a signal increase from 3 microvolts to 100,000 microvolts. The AGC may be derived from either sideband, the carrier, or the combined signal, depending on type of signal being received.
IMAGE REJECTION:	Not less than 60 db down.
INTERNAL BEATS:	Less than .5 microvolt equivalent signal.
AUDIO OUTPUT:	
LINE AMPLIFIERS:	Up to +10 dbm into a 600 ohm balanced line for each output at less than 1% distortion.
SPEAKER AMPLIFIER:	4 watts output at less than 6% distortion into a panel mounted loudspeaker. The speaker amplifier may be switched to either independent sideband output.
SQUELCH:	An automatic noise compensating squelch unit is incorporated within the receiver and operates on the speaker amplifier. This squelch circuit operates independently of signal strength and will perform well on threshold signals.
AUTOMATIC FREQUENCY CONTROL:	The optional AFC circuit locks in on a -16 db pilot carrier whenever the frequency synthesizer is tuned to the nearest 100 Hz. spectrum point.
FADE INDICATOR:	A signal fade indicator provides positive notification when the pilot carrier level drops below acceptable standards.
DRIFT INDICATOR:	The drift indicator lamp will light automatically when the received signal has drifted beyond the acceptable predetermined frequency tolerances.
METERING:	Panel-mounted meter provided to measure AGC, carrier frequency deviation, and line level output for either audio channel.
POWER REQUIREMENTS:	115 or 230 volts AC, 50 or 60 Hz.
POWER CONSUMPTION:	50 watts.
DIMENSIONS:	19½" wide x 13" high x 18" deep.
(IN PORTABLE CABINET).	(49 cm. wide x 33 cm. high x 46 cm. deep.)
WEIGHT (IN PORTABLE CABINET):	55 lbs. net (25 Kg. net).

Since CAI continually improves its products, specifications are subject to change without advance notice.

870G/MK/2½M

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