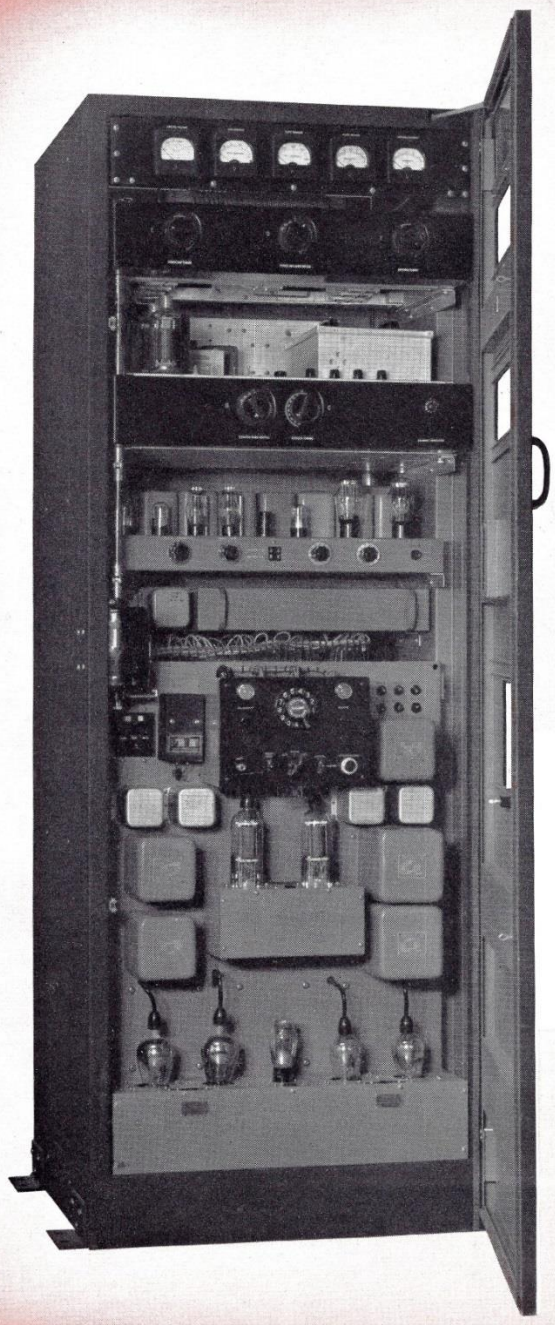
THE COLLINS 16F AUTOTUNE TRANSMITTER



Front inside view

SHOWING THE CONTROL PANEL, AUTO-TUNE HEADS, AND VERTICAL CHASSIS CONSTRUCTION.

THE COLLINS 16F AUTOTUNE TRANSMITTER

APPLICATION

The Collins 16F-9 is a 2-20 mc. war-tested transmitter with a power output of up to 300 watts on phone or up to 500 watts on cw. It is thoroughly trustworthy in applications involving point-to-point, ground-to-plane, and shore-to-ship communications requiring reliable operation on one or more frequency channels. An integral part of the 16F-9 is the widely acclaimed Collins Autotune mechanism which, at the flip of a telephone dial, provides rapid and precise frequency change and sets up the transmitter for operation on any one of ten pretuned channels — all within less than eight seconds.

Long before World War II an earlier version of the sturdy, versatile 16F-9 had demonstrated that a single transmitter, when thoroughly developed by painstaking, extensive laboratory and field research, can satisfy a wide variety of applications. During the war, rugged and exacting military use all over the world brought about refinements which have enabled this transmitter to perform superbly under every conceivable operating condition.

The 16F-9 is highly recommended, even where the application requires only one or two of the available frequencies. The Autotune system adds little to the cost of the transmitter, and permits standardization, with accompanying assembly line technique and quantity production economies.

CONSTRUCTION AND DESIGN FEATURES

Every consideration has been given the mechanical and electrical design of the 16F-9 to assure reliable and trouble-free transmission. Care has been taken to protect structural parts and electrical components against deterioration in humid and corrosive atmospheres. The experience of Collins engineers, and careful construction by skilled Collins craftsmen, are added to the best available electrical and mechanical components.

A single cabinet houses the complete transmitter, with units suitably located and easily accessible. Adequate protection is provided in all circuits against overload and improper sequence.

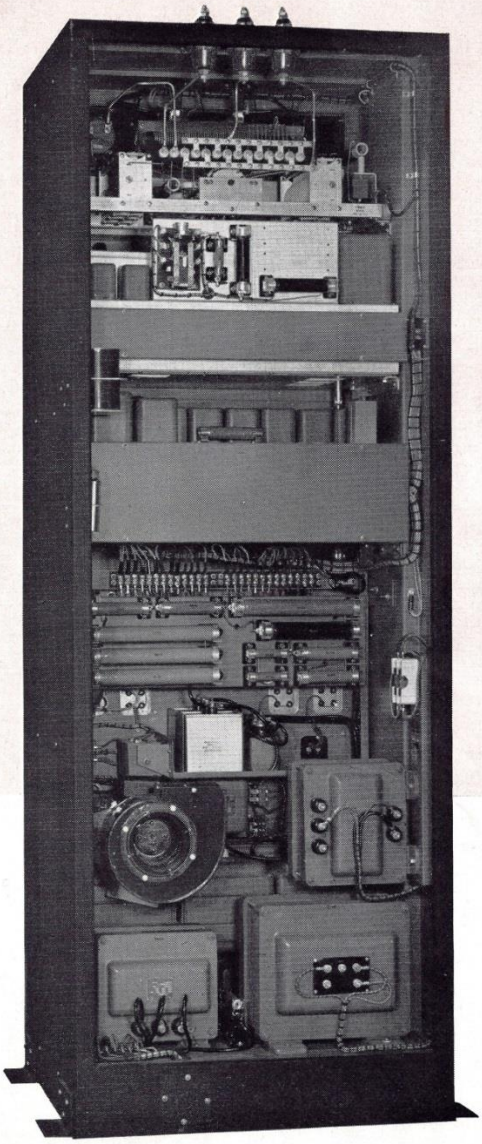
The output network is a fine development of the possibilities of the pi network, made popular by its use in Collins equipment. This unit will efficiently couple the power amplifier stage to an unbalanced antenna over the entire frequency range of the transmitter. A wide range of antenna impedances can be accommodated without the use of an auxiliary tuning unit. Proper circuit Q's are maintained, circuit losses are minimized even at high frequencies, and harmonic components are effectively attenuated. A further feature of the output system is that two antennas may be connected permanently to the output terminals and switched as desired.

The transmitter is complete in every respect except for the antenna, leads to the power source, and interconnecting wiring between the transmitter and the remote control unit.

CONTROL FACILITIES

The full front of the cabinet is a door fitted with a plate glass window for viewing meters. All controls required for tuning, power control, type of emission, emission control, and frequency change are accessible through this door. The audio circuit is so arranged that when the audio controls are set for proper modulation they no longer need attention, and therefore are not accessible through the cabinet front.

Remote control units are available which can be used in parallel if desired, and which will permit control of all transmitter functions from a distance as great as 25 miles, or until the resistance of the remote line loop becomes greater than 1000 ohms or the loss in the line exceeds 25 db. Either of two types can be supplied, one of which is especially adapted for use in locations where the extraneous sound level is high. Each unit contains a receiver disabling circuit.



Rear inside view

GOOD ENGINEERING PROVIDES ACCESSIBILITY

16F-9 PERFORMANCE SPECIFICATIONS

TEMPERATURE RANGE:

0° C to +50° C.

HUMIDITY:

Up to 90% relative humidity at all allowable temperatures.

ALTITUDE:

Sea level to 6000 feet.

TYPES OF EMISSION:

CW, MCW, or Voice. Any mode may be automatically selected with any frequency channel, or may be manually selected.

ANTENNA IMPEDANCE:

Unbalanced antennas or concentric transmission lines with an impedance range of 50-1200 ohms pure resistance, 70-850 ohms at 45° phase angle, or 100-600 ohms at a 60° phase angle. A competent authority should select the antenna most suitable to the particular application. The Collins Engineering Department is available for a discussion of your situation.

POWER OUTPUT:

Up to 300 watts on Voice or MCW; up to 500 watts on CW.

FREQUENCY RANGE:

2,000 to 20,000 kc.

FREQUENCY STABILITY:

.01% to .005%, dependent upon the rating of the quartz crystal.

KEYING SPEED:

Electronic keying allows up to 200 words per minute on CW and up to 60 wpm on MCW. The keying circuit is used as a carrier control for voice operation.

NUMBER OF FREQUENCIES:

Ten, located anywhere within the frequency range.

FREQUENCY SHIFT TIME:

Less than eight seconds.

AUDIO CHARACTERISTICS

INPUT IMPEDANCE:

500 ohms input to the audio amplifier.

INPUT LEVEL:

0 to —25 db. (Zero level of 6 milliwatts into 500 ohms).

FREQUENCY RESPONSE:

Less than 3 db. variation from 150 to 3500 cycles per second.

MCW FREQUENCY:

Variable in 7 steps from 400 to 1200 cps.

COMPRESSION CHARACTERISTIC:

Less than 3 db rise in the audio output with a 15 db increase in input signal. Control should be set to start compression at 70% modulation.

DISTORTION:

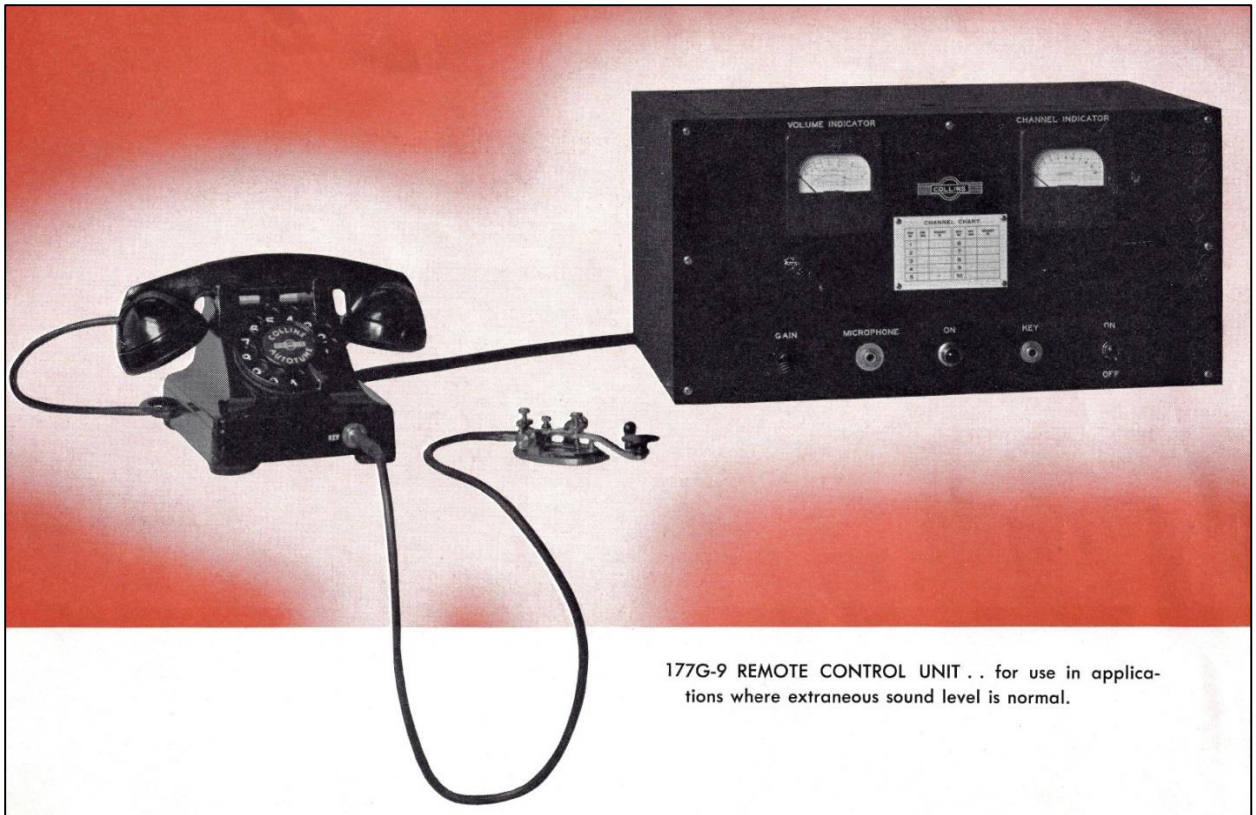
Less than 10% of total harmonic distortion up to 95% modulation and 15 db of compression.

NOISE:

At least 40 db below 100% modulation.

POWER SOURCE:

115/230 volts, 50/60 cycles, single phase for the transmitter. 115 volts, 50/60 cycles, single phase for the remote control unit. Maximum power required is approximately 1600 watts at 85% power factor.



177G-9 REMOTE CONTROL UNIT . . for use in applications where extraneous sound level is normal.

WEIGHT AND DIMENSIONS

Unit	*Size*	*Weight*
Transmitter	28″ x 50¼″ x 80⅝″	1170 lbs.
117G-8 Control Unit	19″ x 9½″ x 10½″	31 lbs.
177G-9 Control Unit	19″ x 10⅞″ x 8¾″	56 lbs.

APPROXIMATE SHIPPING WEIGHTS AND VOLUMES (Less Spares):

	Wgt.	*Vol.*	*Cases*
Domestic	2000 lbs.	140 cu. ft.	10
Export	2100 lbs.	140 cu. ft.	10

16F-10 PERFORMANCE SPECIFICATIONS

GENERAL:

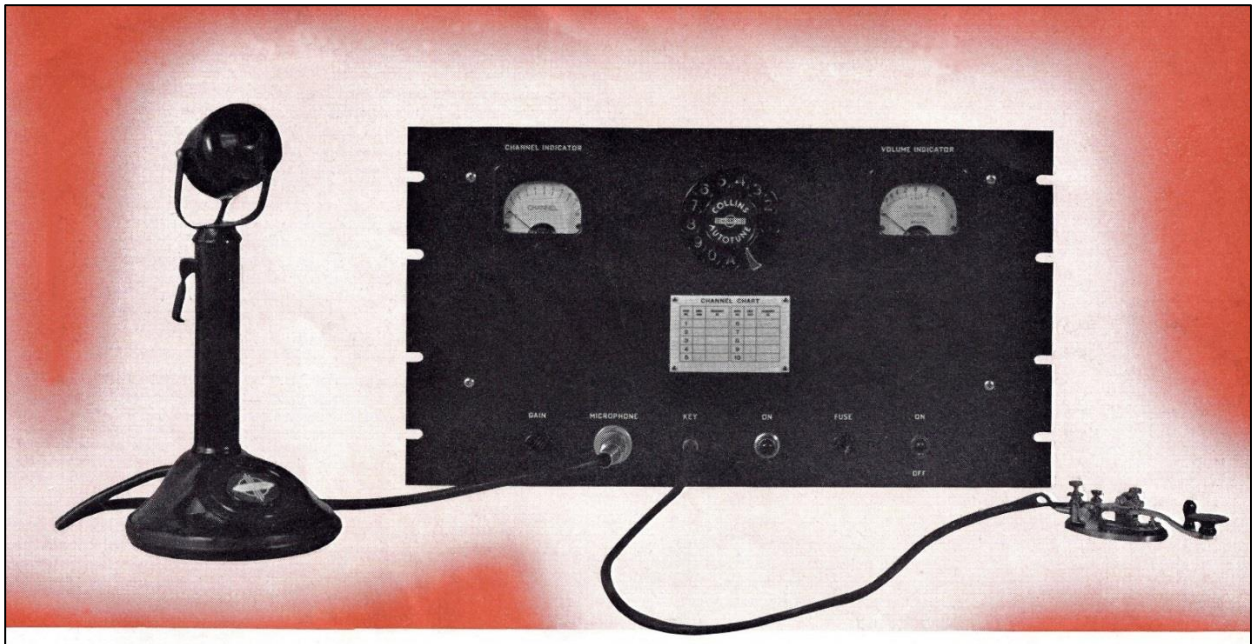
The 16F-10 is different from the 16F-9 in that the frequency control is by means of a highly stable master oscillator, operated by the Autotune system. A crystal frequency indicator, which provides 50 kc. check points at the m.o. frequency, is incorporated in the 16F-10.

FREQUENCY RANGE:

2,000 to 18,100 kc.

NUMBER OF FREQUENCIES:

Eleven, of which ten may be arranged to have automatic emission control. The type of emission on the eleventh channel may be selected by dialing. The eleventh channel does not have remote indication. There is also a manual position on which a twelfth frequency may be tuned as desired.



177G-8 REMOTE CONTROL UNIT . . especially adapted for use in locations where extraneous sound level is high.

TUBE COMPLEMENTS

16F-9	*Use*	*16F-10*
837	Crystal Oscillator	
	Master Oscillator	6A8
	Untuned amplifier	6AG7
807	Frequency multiplier	2-807
2-813	Power Amplifier	2-813
6SL7GT	Audio preamplifier	6SL7GT
6C8G	Compressor tube	6SN7GT
6C8G	Audio squelch	6SN7GT
6SJ7	Audio amplifier	6SJ7
6X5GT/G	Compressor rectifier	6X5GT/G
2-2A3	Audio driver	2-2A3
2-805	Modulator	2-805
6SN7GT	MCW osc. and amp.	6SN7GT
6X5GT/G	Keyer rectifier	
	Voltage regulator	OD3/VR150
6SJ7	Keyer	6SJ7
	CFI Oscillator	6A8
	CFI mixer	6SL7GT
	CFI audio amplifier	6SN7GT
2-866A/866	Low voltage rectifier	2-866A/866
2-249C	High voltage rectifier	2-249C
5U4G	Bias Rectifier	5U4G

177G-9 REMOTE CONTROL UNIT

Audio amplifier	6V6GT/G
Receiver control	6SJ7
Rectifier	5U4G

177G-8 REMOTE CONTROL UNIT

Audio amplifier	6SJ7
Audio amp. and rec. control	6SN7GT
Rectifier	6X5GT/G

THE COLLINS main plant in Cedar Rapids is a modern, completely air and light controlled structure, containing 150,000 square feet of floor space. It is designed for the most efficient office, engineering and manufacturing use. The COLLINS management, organization and equipment are devoted entirely to the designing and production of radio communication equipment.

COLLINS RADIO COMPANY, CEDAR RAPIDS, IOWA

11 West 42nd Street, New York 18, New York

IN RADIO COMMUNICATIONS, IT'S . .

COLLINS

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