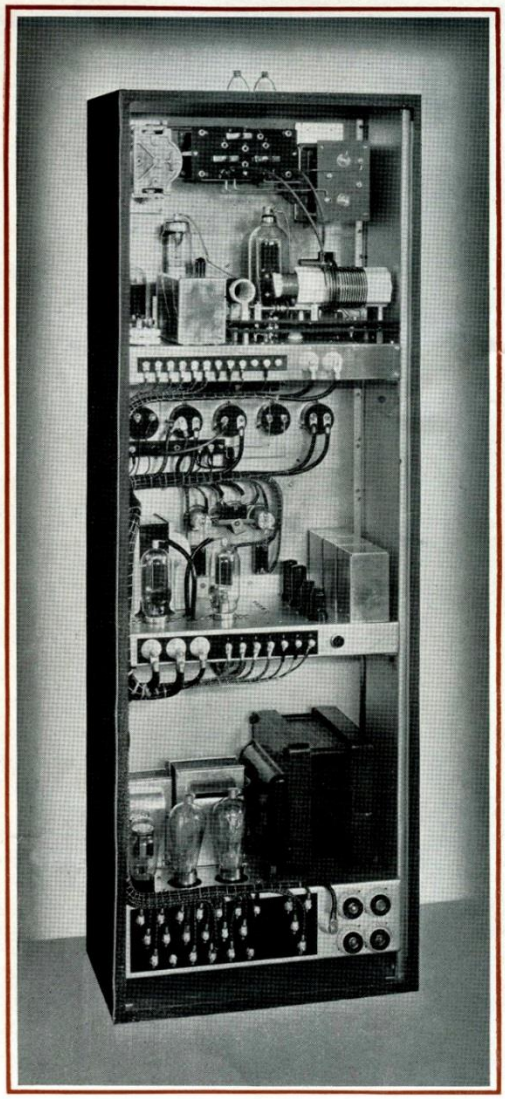
. . . . . Calling All Continents



THE 30 FXC TRANSMITT

THE high output of the Type 30FXC Transmitter is of importance, but equally worthwhile are the many refinements which contribute to convenience of operation and increased utility. For example, the 30FXC's system of shifting frequencies is the fastest and easiest arrangement yet devised which gives full efficiency at each frequency. The antenna network is continuously adjustable over the entire frequency range of the transmitter—a complete complement of meters and power controls is provided. In short, the 30FXC has every feature which experience has shown to be desirable in a general purpose high frequency transmitter.

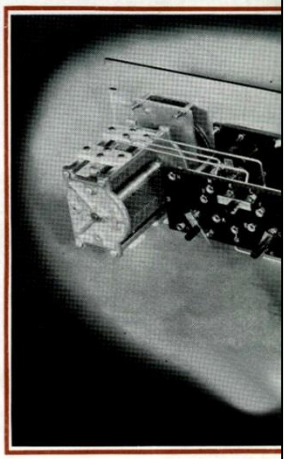
Radio Frequency Circuit

The 30FXC Transmitter's 200 watt output is obtained very efficiently by operating the power amplifier stage under optimum conditions. Factors which contribute to high efficiency are the use of a relatively high plate voltage, correst bias and excitation, inductive neutralization and the new "L" section output network. The C201 power amplifier tube is especially suited for operation at high frequencies. In normal operation the plate efficiency of the power amplifier is between 75% and 80% although the nominal output rating of the transmitter is based on an assumed efficiency of 60%. In practice, the efficiency does not fall below 75% except on the highest frequencies. An RK20 is used as an intermediate amplifier to assure adequate excitation for the power amplifier. Both the power amplifier and the intermediate amplifier operate on the output frequency over the entire frequency range of the transmitter. It is possible to use a low frequency crystal when operating on the highest frequencies since two frequency multiplier stages operating at low level are included. The frequency multipliers are switched in and out of the circuit as needed and are only called upon to deliver approximately one watt of power to the intermediate amplifier.

A very convenient arrangement is made to accomplish rapid shifting of frequency from one band to another. A switch controlled from the panel selects the required output frequency for excitaton of the RK20 intermediate amplifier, either directly from the crystal oscillator or from the first or second frequency multiplier stages. ..The tank circuits for the oscillator and frequency multipliers, although of the plugin type, are not ordinarily changed when shifting from one band to another. The excitation tank circuits are pre-tuned and need not be adjusted when shifting bands, although their condenser dials are accessible from the front panel for preliminary adjustment. The tank circuits for the intermediate and power amplifiers are mounted on a single plugin unit which is changed for each frequency band. The Type 10M Radio Frequency Unit includes all of the r-f components in a single assembly.

Antenna Matching Circuit

The 30FXC Transmitter makes use of an "L" section antenna matching system which is an important development derived from the familiar "pi" type matching section previously associated with Collins transmitters. The principal component of the new antenna matching system is the Type 180B Continuously Variable Balanced Inductor. This inductor consists of two coils which may be rotated from the front panel and a special contact device which varies their effective inductance continuously from maximum to substantially zero. The two coils are arranged with a gear train and a flush dial indicator so that the in-



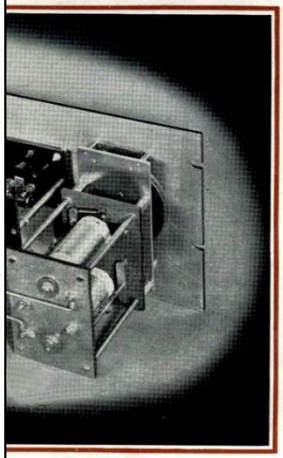
TYPE 2R "L" SE

ER 200 Watts Output

ductances of the coils are equal at all settings. The design of the system is such that the losses are as low as those of fixed coils of the same dimensions. The Type 180B Inductor is used as a variable series arm in an "L" type of network. The shunt arm is a 500 mmf split stator condenser and the combination is capable of matching an extremely wide range of antenna impedances. Adjustment of loading is continuous and is made entirely from the front panel. The antenna matching assembly is designated as the Type 2R Antenna Matching Network.

Audio Frequency Circuit

The Type 9RA Amplifier-Modulator Unit containing both the speech amplifier and the class B modulator is used in the 30FXC Transmitter. The Type 9RA Unit is capable of high-fidelity performance under the conditions of service for which the 30FXC Transmitter is used. Metal tubes are employed to advantage in the speech amplifier and the 830B class B tubes are operated so that 170 watts of audio power is available for complete modulation of the power amplifier. Provision is made so that the sockets for the modulator tubes can be changed to accommodate either RK31 or 203A tubes in special applications. A receptacle for the new Type 221-17 Microphone Plug is provided at the rear of the modulator unit and a bushing allows the microphone cable to be carried through the side of the transmitter cabinet The speech amplifier is arranged for the use of a diaphragm type crystal microphone. The gain control is located on the front panel of the transmitter.



TION NETWORK

Power Supply

The Type 415A Power Unit incorporated in the 30FXC Transmitter delivers 1250 volts to the plate of the intermediate amplifier, the power amplifier and the class B modulators. A second rectifier supplies plate power for the crystal oscillator, frequency multipliers and the speech amplifier. Two filament transformers provide the necessary voltages for the various tubes in the transmitter. The Type 415A Power Supply is of very rugged and compact construction, yet each component is of adequate size to insure good voltage regulation and minimum temperature rise. The smaller iron core units and the filter condensers are mounted beneath the chassis. Oil filled filter condensers are used. Individual fuses are employed to afford overload protection for each rectifier and filament circuit. All terminals are brought out at the rear of the chassis and connected with the inter-unit cable. External connections to the transmitter are also made to the same group of terminals.

Instruments

Five flush type instruments are furnished for reading filament voltage, intermediate amplifier plate current, power amplifier plate current, modulator plate current and grid current. The grid current meter is arranged with a switch so that either the power amplifier grid current or grid current in the excitation stages may be read. The Type 2R Antenna Matching Unit carries two r-f ammeters for indication of radio frequency output current. The second r-f meter is convenient since it permits a comparison of the currents in each side of a balanced transmission line. The r-f meters are recessed from the metal panel to reduce shunt capacity across the transmission line and thereby improve operation at 30 mc.

Power Controls

The power controls for the 30FXC Transmitter have been very carefully worked out to afford greatest convenience in operation. Three switches con-

30FXC TRANSMITTER

trol filament power, 400 volt plate power and 1250 volt plate power. The switches are interconnected in such a way that the plate power cannot be turned on until after the filament circuit is closed. The 400 volt plate power switch serves as a "stand-by" control to disable the transmitter during reception. Operation of this switch disconnects both rectifiers so that there is no possibility of interference from the mercury rectifier tubes being present during reception. The power switches are on the front panel of the transmitter, and when the transmitter is located near the operating position, no external switch connections are needed. The usual arrangement for remote control consists of a single switch connected to two terminals at the back of the transmitter, to duplicate the functions of the "stand-by" switch on the transmitter panel. Application of filament and plate voltage is indicated by two large pilot lights. A further convenience in operation, when a quick change from telegraph to telephone is desired, is afforded by the "CW-PHONE" switch also located on the transmitter panel which disconnects the modulator tubes and shorts the modulation transformer in the "CW" position.

Optional Accessories

The standard 30FXC Transmitter together with the required tubes, crystal and microphone is ready to operate. Several accessories are available, however, for special applications where they can be used to advantage.

ANTENNA RELAY: The Type 400-20 Antenna Relay may be installed inside the 30FXC cabinet, next to the antenna terminals to automatically transfer the two-wire antenna line from the receiver to the transmitter when the "Stand-By" switch is closed. This arrangement is effective for rapid two-way communication and it allows full advantage to be taken of the transmitting antenna during reception. The relay is A.C. operated and is extremely fast in action. Insulation is mycalex.

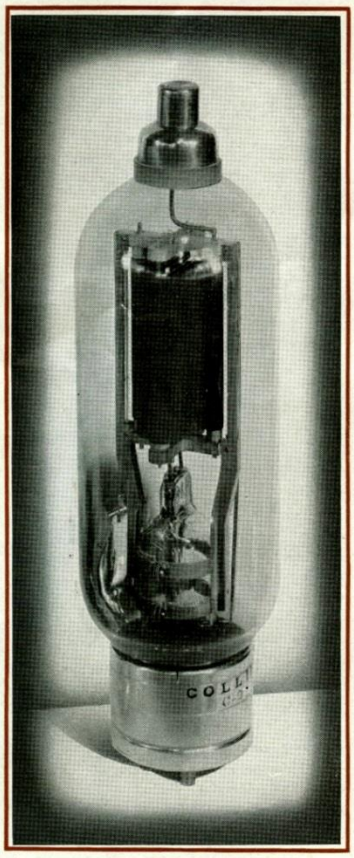
Type 400-20 Antenna Relay
Code Word YODUP

BROADCAST PLATE FILTER: The carrier noise level of the standard 30FXC is very low and, for practical purposes, inaudible. Installation of the Type 500A Filter Section reduces the carrier noise still further to the level accepted for high fidelity broadcasting. The Type 500A Filter is intended to be used only when the 30FXC Transmitter is placed in high frequency broadcast service. The filter is mounted by means of four bolts between the modulator and power unit chasses and connection is made without changing existing wiring.

Type 500A Filter Section
Code Word ZACRO

ELECTRONIC TIME DELAY: When the 30FXC Transmitter is to be operated by untrained personnel or by remote control it is desirable to have an automatic device to delay application of plate power until the filaments reach operating temperature. This result may be accomplished by the Type-14P Electronic Time Delay which is installed on the control panel. An amplifier tube and a delay circuit are used to control a contactor with provision for automatic re-cycling, ie., a momentary power interruption even during the starting period will cause the device to delay through an entire new cycle of operation.

Type 14P Electronic Time Delay
Code Word ZAFER



C201 POWER AMPLIFIER TRIODE

★ 30FXC Specifications ★

Power Output: 175 watts nominal rating.

Frequency Range: 1500 to 30,000 kc.

Radio Frequency Tubes: 1—C100 Crystal Oscillator, 1—46 First Frequency Multiplier, 1—46 Second Frequency Multiplier, 1—RK20 Intermediate Amplifier and 1—C201 Power Amplifier. The final r-f stage operates as a straight amplifier over the entire frequency range.

Audio Frequency Tubes: 1—6C5 First Voltage Amplifier, 1—6C5 Second Voltage Amplifier, 2—6F6 Audio Drivers, 2—830B (or RK31) Class B Modulators.

Rectifier Tubes: 2—5Z3 400 volt rectifiers and 2—866A 1250 volt rectifiers.

Dimensions: 55" high, 13" deep, 19" wide.

Weight: Net—260 lbs. Shipping—320 lbs.

Power Consumption: 1000 watts at full modulation. 850 watts, telegraph. Power factor 90%.

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