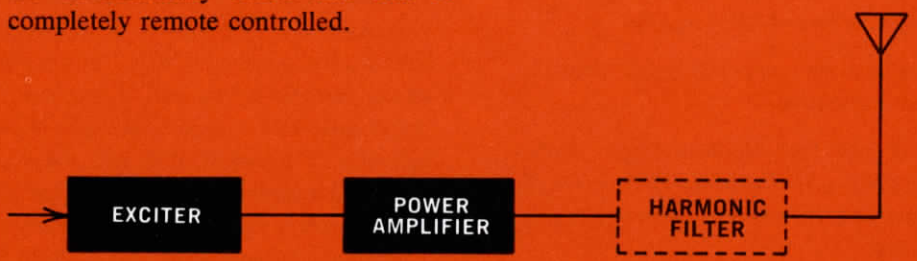
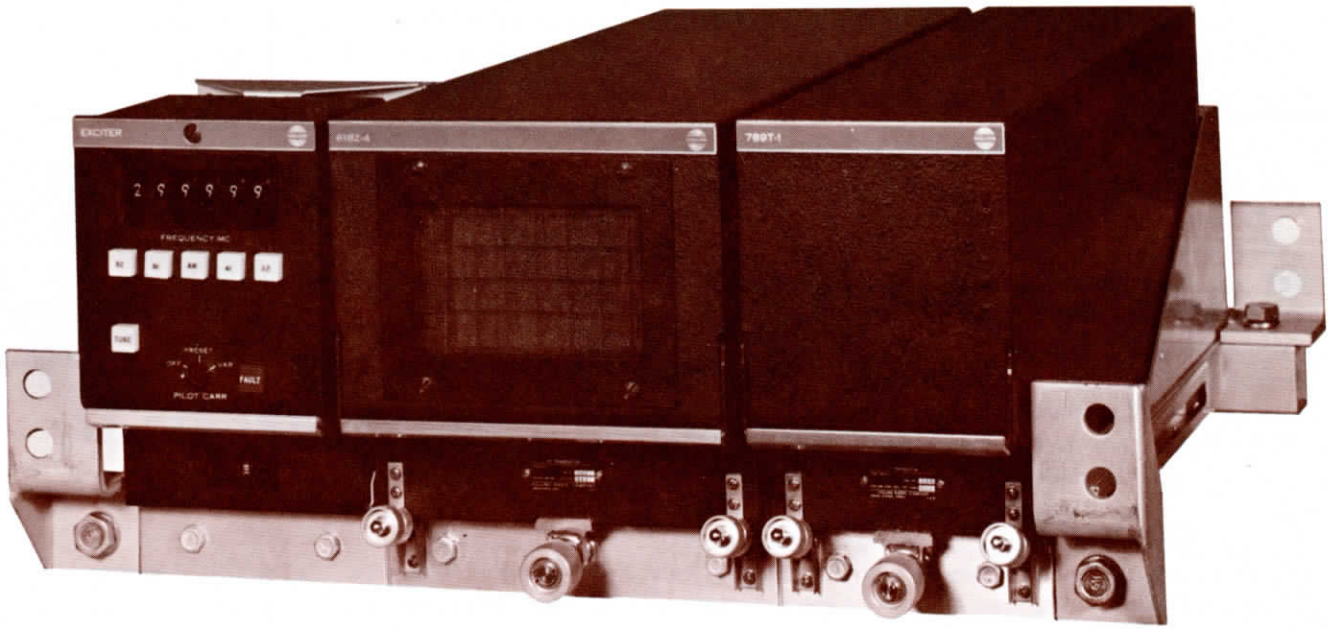
Transmitting Equipment

Collins HF exciters, using efficient mechanically filtered sideband generators, are ideally suited for use in fixed station, airborne, mobile, transportable and shipboard applications. A choice of 1, 3, 10 and 45 kw PEP power amplifiers is available to increase the exciter output to the desired levels. The equipments are automatically tuned and can be completely remote controlled.



310V-1 universal radio group Exciter



Features	Applications
Automatic Tuning	*Fixed Station*
Compact Packaging	*Transportable*
Telephone Compatibility	*Shipboard*
Installation Flexibility	*Mobile*
Remote Operation	

The 310V-1 is a shelf mounted HF exciter which, together with an automatically tuned power amplifier of the desired level, provides an extremely versatile HF transmitter. It offers a choice of 0.1 kc or 1.0 kc channel increments over the 2.0-29.9999 mc frequency range.

Modes of operation include upper sideband, lower sideband, independent sideband (separate channels on each sideband), or compatible AM with a choice of 3 kc or 6 kc bandwidths. Four 3 kc SSB multiplex channels may be optionally used. Power output is 0.4 watt PEP for continuous duty operation. The 310V-1 is part of the Collins Universal Radio Group of building block equipments, which can be selected to meet a wide range of communication requirements.

310V-1 on 19″ shelf

SYSTEM APPLICATION

The 310V-1 is ideally suited for fixed station, transportable, shipboard or mobile applications. A simplified automatic tuning system permits control from a local shelf or console mounted unit or by a dial pulse remote arrangement over telephone lines. Audio terminations are compatible with telephone industry standards.

EXCITER CONFIGURATION

The 310V-1 consists of an IF translator, an RF translator, and distribution frame on a rack mounting shelf with an integral cooling air plenum. It is compatible with either Unistrut racking or cabinet enclosures. The IF translator employs card cage construction to permit a choice of operational capability for the initial installation and to facilitate modification as communication needs change. The RF translator contains the RF tuner and frequency stabilizing circuits.

FOUR CHANNEL MULTIPLEX

As many as four 3 kc bandwidth audio inputs can be multiplexed in the IF translator. The level of each individual channel is automatically adjusted according to the number in use. ALC of the multiplex signal is provided by a bias from the final stage of the associated power amplifier.

EASE OF MAINTENANCE

Transistors and semiconductors are used wherever applicable to reduce size, minimize power consumption and increase reliability. Each individual card or module contains a complete circuit division, facilitating routine or corrective maintenance procedures.

BASIC CONFIGURATIONS

The 310V-1 Exciter is normally supplied for 3 kc USB channels, 1 kc tuning increments, operation from an internal fre-

quency standard and a 27.5 v dc power source. It includes a 499L-2 22″ wide mounting shelf with a cooling air plenum for attachment to rack cooling systems. A wiring distribution frame and circuit breaker are also included.

OPTIONAL CONFIGURATIONS

Mode Options The following choices are available to meet specific operating requirements: LSB, 3 kc bandwidth; LSB, 6 kc bandwidth; USB, 6 kc bandwidth; 4-channel multiplex; and AM modes.

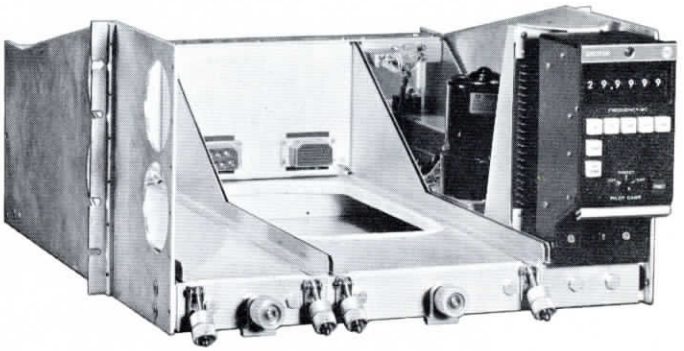
Tenth KC Channel Increment Option The number of RF channels can be increased to 280,000 for more effective spectrum utilization.

Line Amplifier Options Plug-in audio line amplifiers can be used if the audio input level is below the required level. Both single channel and dual channel amplifier card modules are available. Individual level adjustments are provided.

External Frequency Standard Option This option offers greater frequency stability for data communication application.

Memory Matrix Option The memory matrix is necessary only in systems sharing frequency control information between equipments. In installations which share frequency control equipment, the 0.1 kc digit information is retained in the absence of continuous frequency information until a new frequency is selected. It is intended primarily for installations using the 313 series of wire line control equipments.

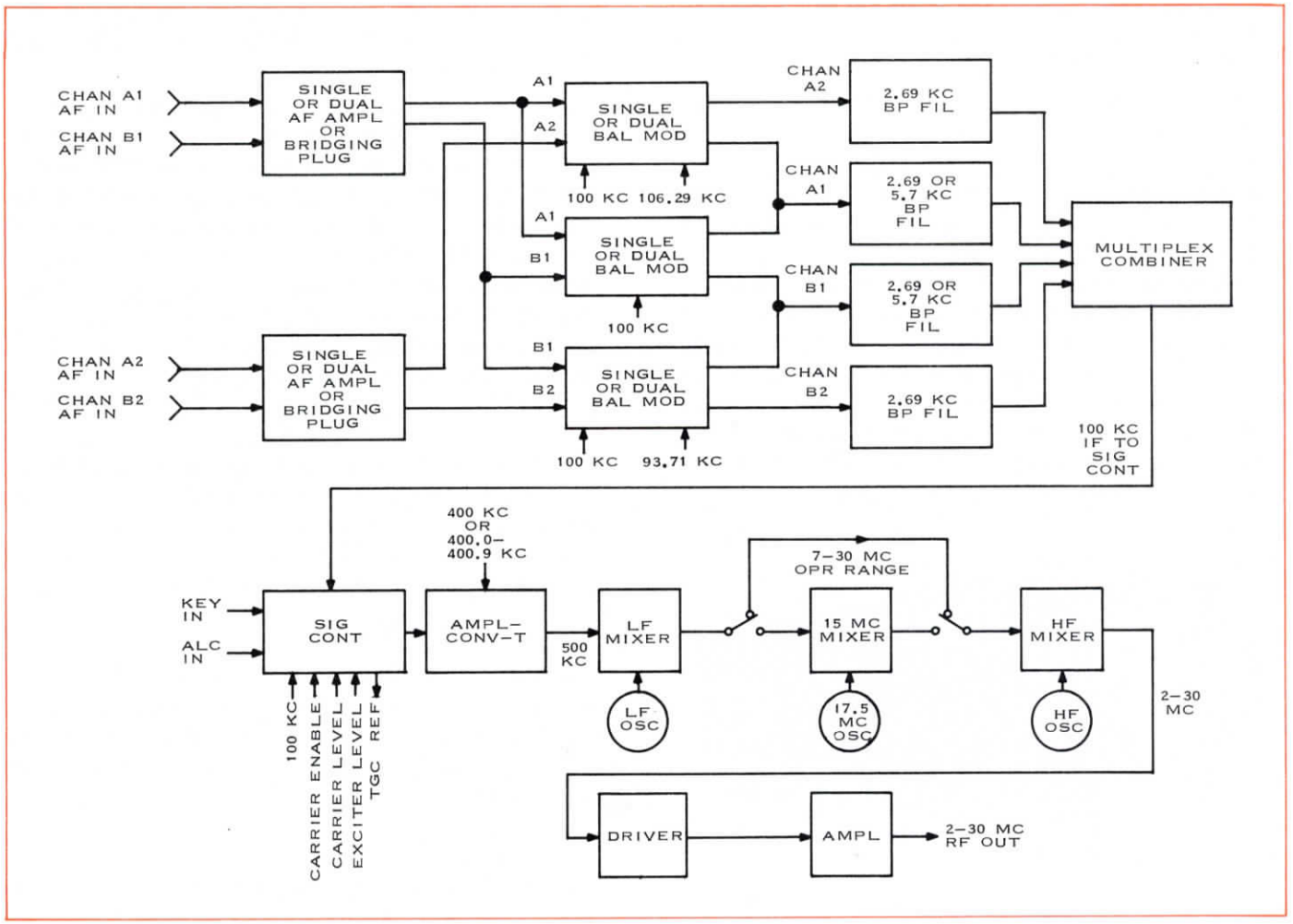
Power Supply Options An internal power supply offers operation from a 115 v or 230 v, 45-450 cps power source in lieu of the normal 27.5 v dc.



Easily removed subunits

Mounting Shelf Options (1) A 499L-2 shelf as normally supplied, except designed for a 19″ rack and including an integral blower. (2) A 499L-2 shelf as in option 1, except with an exciter control unit. (3) A 499L-2 shelf as normally supplied, except with an exciter control unit.

Functional Circuits



Specifications

FREQUENCY RANGE: 2.0-29.999 mc or 2.0-29.9999 mc with 1.0 kc or 0.1 kc channel increments.

TRANSMISSION MODES: SSB — USB, LSB, ISB (3 kc or 6 kc nominal bandwidths), or four nominal 3 kc channels multiplexed. AM — Compatible.

TUNING TIME: Not more than 8 seconds after selection of frequency.

SELECTIVITY: Determined by individual bandpass filter electrical characteristics.

Filter	*1 DB Maximum Ripple From*	*60 DB Attenuation Points*
A-1 (nominal 3 kc)	100.35-103.04 kc	NLT 99.925 kc NMT 103.30 kc
A-2 (nominal 3 kc)	103.25-105.94 kc	NLT 102.99 kc NMT 106.31 kc
B-1 (nominal 3 kc)	96.96-99.65 kc	NLT 96.70 kc NMT 100.075 kc
B-2 (nominal 3 kc)	94.06-96.75 kc	NLT 93.69 kc NMT 97.01 kc
A-1 (nominal 6 kc)	100.30-106.00 kc	NLT 99.70 kc NMT 107.00 kc
B-1 (nominal 6 kc)	94.00-99.70 kc	NLT 93.00 kc NMT 100.30 kc

Maximum ripple in the filter passband — 1.0 db from +15°C to +65° C; 1.5 db from −30°C to +15° C; 3.0 db from −40° to −30° C.

FREQUENCY CONTROL: All injection sources except A-2 and B-2 carrier injection are phase locked to a 100 kc standard.

STABILITY: Internal standard — 1 part in 10^8 per day due to aging; rms stability factor does not exceed 1 part in 10^8 in any 10-minute period. Multiplex channels A-1 and B-1 determined by reference source; channels A-2 and B-2 can have an additional deviation of ±2 cps.

RF OUTPUT: 0.4 watt PEP minimum into nominal 50 ohms.

OUTPUT DISTORTION: Third and higher order distortion products are suppressed at least 40 db below 0.4 watt PEP, measured by the standard two-tone test technique.

HARMONIC EMISSION: At least 50 db below nominal peak envelope voltage levels.

INTERMODULATION DISTORTION: Not less than 40 db down.

ADJACENT CHANNEL CROSS-TALK: Not less than 45 db down.

HUM: Not less than 50 db below one tone of a two-tone 0.4 watt PEP test signal.

SPURIOUS EMISSION: 40 db below nominal PEV.

TRANSMIT GAIN CONTROL: In response to dc levels of 4 v or more derived from the output of the IF translator and the output of the RF translator or power amplifier, an infinite memory automatic gain control will maintain the dc levels proportional within +1 db.

AUTOMATIC CHANNEL LOADING: Single or any combination of channel inputs maintained at nominal input level will be controlled automatically to permit minimal excursions above nominal PEV level or operation into the ALC region.

AUDIO INPUT LEVEL: A −6 dbm, single tone input will produce maximum RF output with the exciter gain control full on and no ALC/TGC input. Specified distortion characteristics will be maintained with a two-tone input each having −6 dbm level with ALC voltage applied to maintain output level at 0.2 watt PEP. When implemented with the line amplifiers, tones at −26 dbm will meet the same specified output requirements.

AUTOMATIC LOAD CONTROL: Input voltage in the range 0 v to −10 v will cause the exciter output to be reduced at least 20 db. Minimum distortion requirements are met with up to 10 db reduction in gain. Application of ALC control will not affect carrier output in the AM or reduced carrier modes and will not affect the TGC.

POWER REQUIREMENTS: 24.0-30.25 v dc negative grounded with no more than 0.5 v peak ripple, 170 watts nominal. Can be implemented for 115 v, 45-450 cps.

SIZE: 22 5/16″ W, 8¾″ H, 24½″ D (56.67 cm W, 22.23 cm H, 62.23 cm D), including shelf.

WEIGHT: 62 lbs. (28.12 kg) minimum implementation; 80 lbs. (36.29 kg) maximum, including shelf.

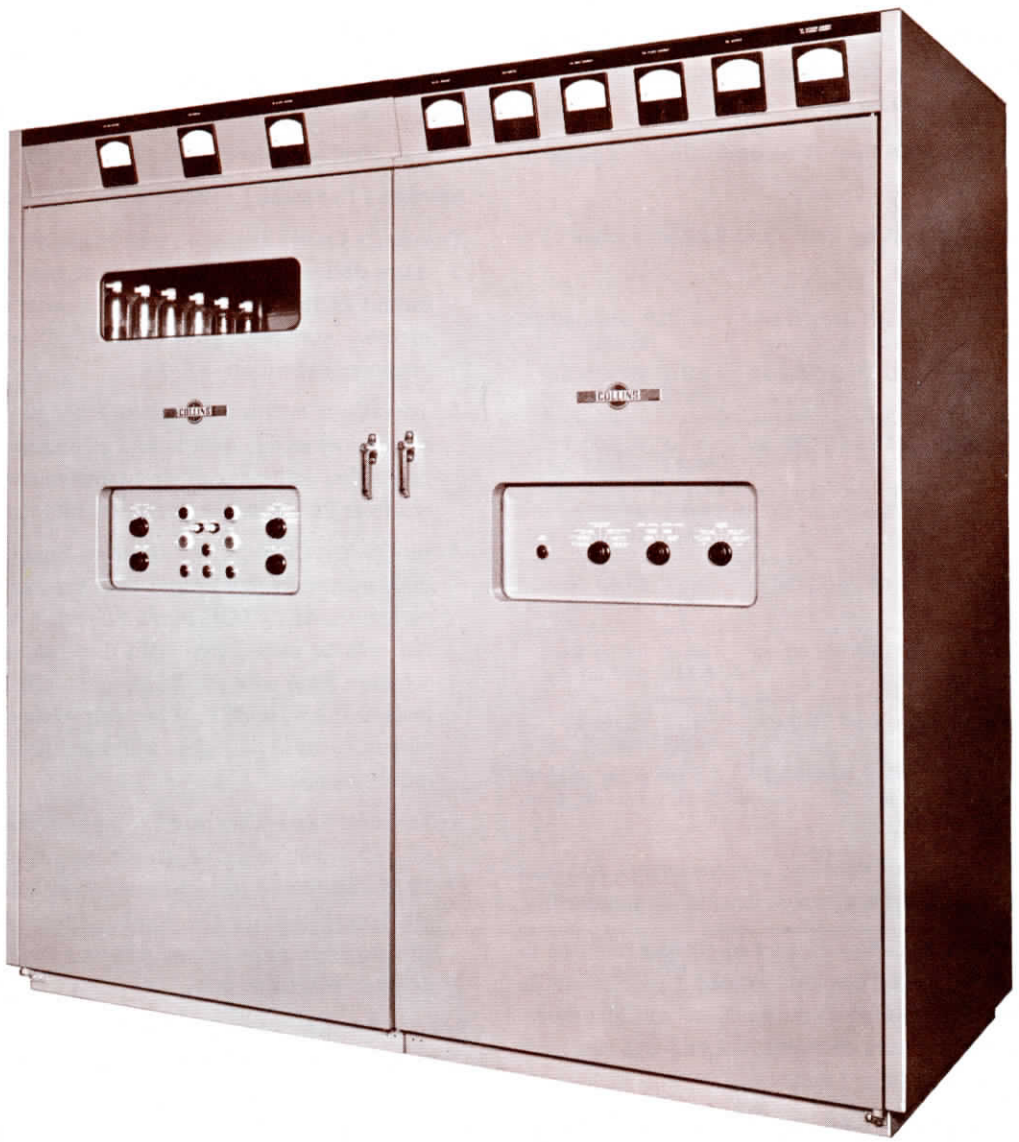
Basic Units

789T-1 IF Translator, p. 88-90
618Z-4 RF Translator, p. 87

Related Equipment

Power Amplifiers, p. 28-37
426U-2 Power Supply, p. 86
313 Series Controls, p. 83-85
Racks and Cabinets, p. 91
Antennas, p. 92-99
635W-1 Harmonic Filter, p. 113
184U-10 RF Matrix Uniswitch, p. 106, 107

205J-1 45 KW HF Power Amplifier
OA-1448/GRT



Features

Servo Tuning
Simplified Controls
Power Selection
Functional Enclosure
Conservative Ratings

Applications

Fixed Station
Long Path

The 205J-1 is an automatically tuned linear power amplifier with 45 kw PEP output over the 2-30 mc frequency range. A power reduction circuit allows the level to be quickly reduced to 12 kw.

Low distortion amplifiers permit transmission of multiplex signals without mutual interference between subchannels.

The 205J-1, with an external HF exciter and antenna system, provides a complete transmitter for fixed station use. The input level required is only 0.2 watt at the operating frequency. It is especially suited for long range point-to-point or ground-to-air single sideband communication applications. It can be arranged for local or remote control in either attended or unattended operation.

Dependability, long life and savings in size and weight are achieved by modern tubes and components, together with proven single sideband circuitry. The 205J-1 is easily serviced and maintained. All important circuits are metered. Components and wiring are accessible through full length electrically interlocked cabinet doors.

 Available only on a production contract.

AUTOMATICALLY TUNED

RF and prepositioning information for the tuned circuits of the power amplifier is supplied by an external exciter. Prepositioning information can also be obtained from an internal control panel. Phase discriminator servo systems within the equipment automatically complete the tuning and loading of the three amplifier stages. A pi-L network is used for output coupling. A directional coupler measures the forward and reflected power in the output transmission line.

LOW DISTORTION

Reduced distortion and improved linearity are achieved by the use of approximately 10 db of negative over-all RF feedback in the power amplifier.

AUTOMATIC GAIN CONTROL

Transmitter gain control circuitry permits adjustment of the signal level to operate the power amplifier near its maximum power capability without the possibility of it being overdriven on peaks. Rectified voltage derived from the signal peaks is used to control circuitry in the associated exciter, reducing the excitation level on signal peaks.

AUTOMATIC PLATE DISSIPATION CONTROL

Automatic plate dissipation control circuits allow the power amplifier to operate at full input during the tuning cycle and remove the requirements of high/low power switching with its accompanying problems.

CONSERVATIVELY RATED SUPPLIES

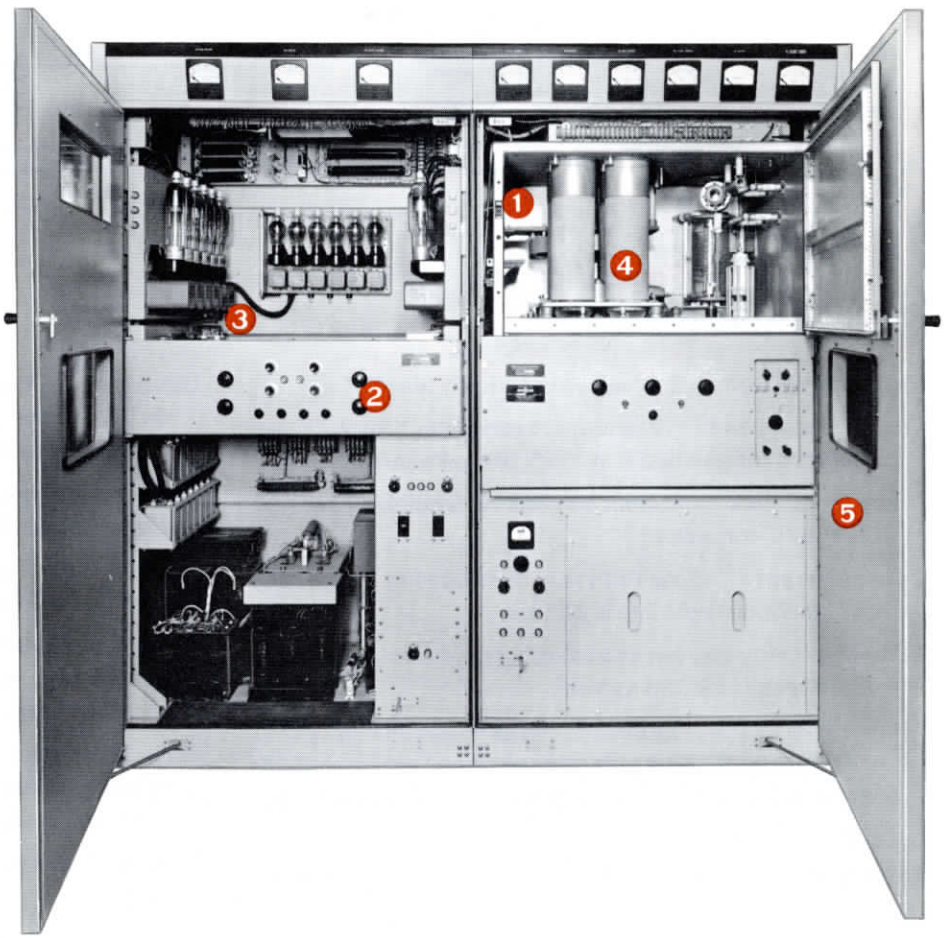
Efficient three-phase, full-wave rectifier circuits are used in both plate and screen supplies. The screens of the tubes in the output stage are connected directly to ground to give maximum effectiveness to the screen grid shielding. The PA cathodes are operated 700 v below ground, making the total final amplifier plate supply voltage 7,500 v.

The negative side of the PA plate supply is grounded through the primary of a thyratron trigger transformer. In the event of a high voltage arc to ground, the initial surge of current in the negative return fires a thyratron. This action effectively shorts the high voltage supply to ground.

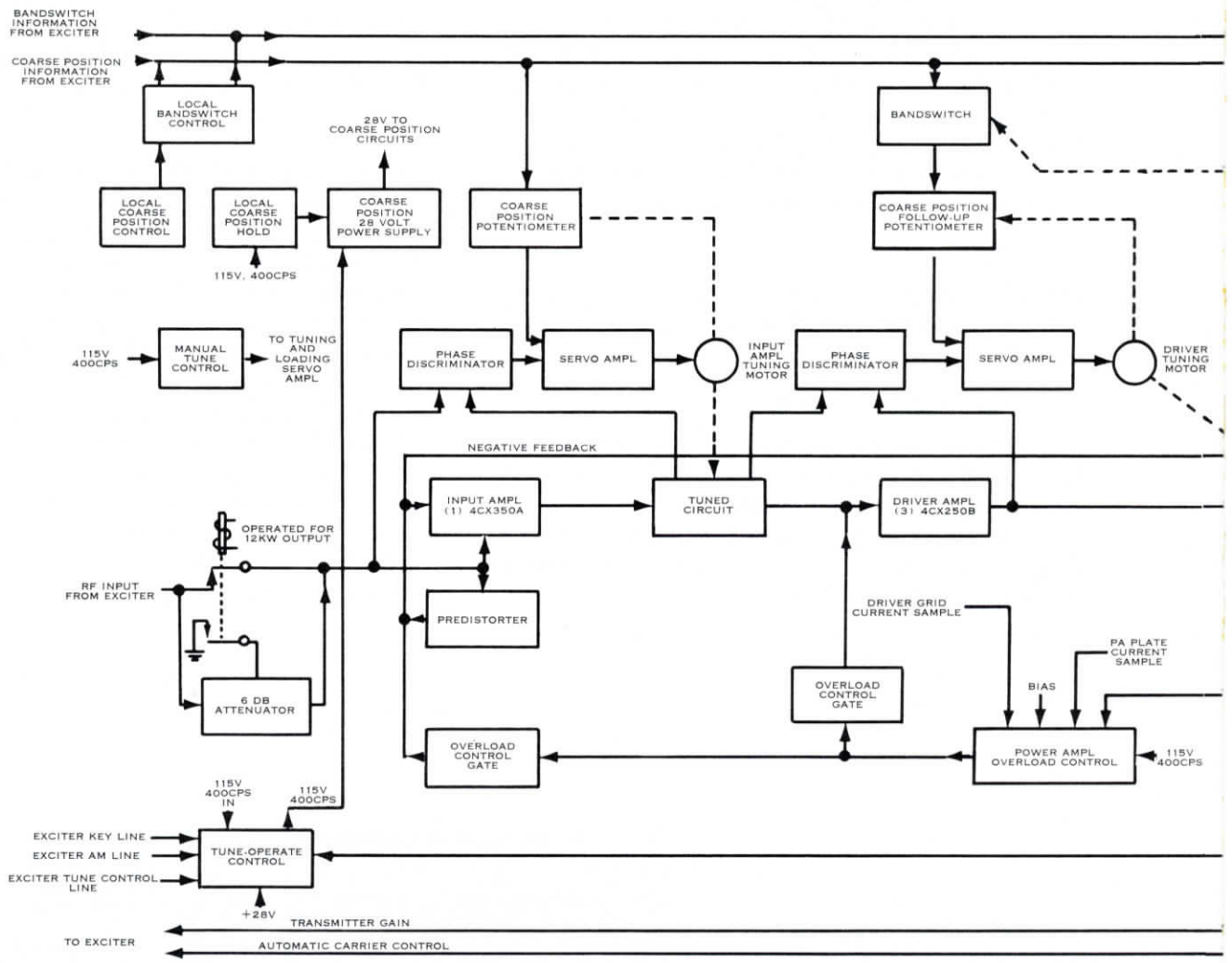
The low voltage plate and screen supply also use a three-phase, full-wave rectifier. Mercury vapor rectifier tubes are temperature-controlled allowing operation of the power amplifier at low ambient temperatures.

Design Highlights

1. *Separate shielded compartments for each RF stage.*
2. *Simplified operating controls are located on recessed panels.*
3. *Conservatively rated power supplies have excellent dynamic regulation.*
4. *Ceramic tetrode tubes provide high gain with few amplifier stages.*
5. *All components and wiring are accessible through full length doors.*



Functional Circuits



Specifications

FREQUENCY RANGE: 2-30 mc, automatically tuned.

OUTPUT IMPEDANCE: 50 ohms, 2:1 maximum VSWR. Flange connection for standard EIA 3⅛" 50 ohm transmission line.

INPUT IMPEDANCE: 50 ohms unbalanced, termination for type UG-89B/U connector.

POWER OUTPUT: 45 kw PEP; may be reduced to 12 kw PEP. Average output capability is 22.5 kw.

EMISSION: Any type not exceeding bandwidth or power capability. Superior for SSB service.

INPUT INFORMATION REQUIRED: 0.2 watt nominal at operating frequency, together with bandswitch and coarse positioning information for automatic operation. Semi-automatic operation only requires RF drive signal.

RF BANDWIDTH: Not less than 16 kc bandwidth between —1 db points.

DISTORTION: Third and higher odd-order distortion at least 35 db below either of two equal tones required to drive the power amplifier to 45 kw PEP.

HARMONIC OUTPUT: Second harmonic at least 50 db down. Higher harmonics at least 60 db down.

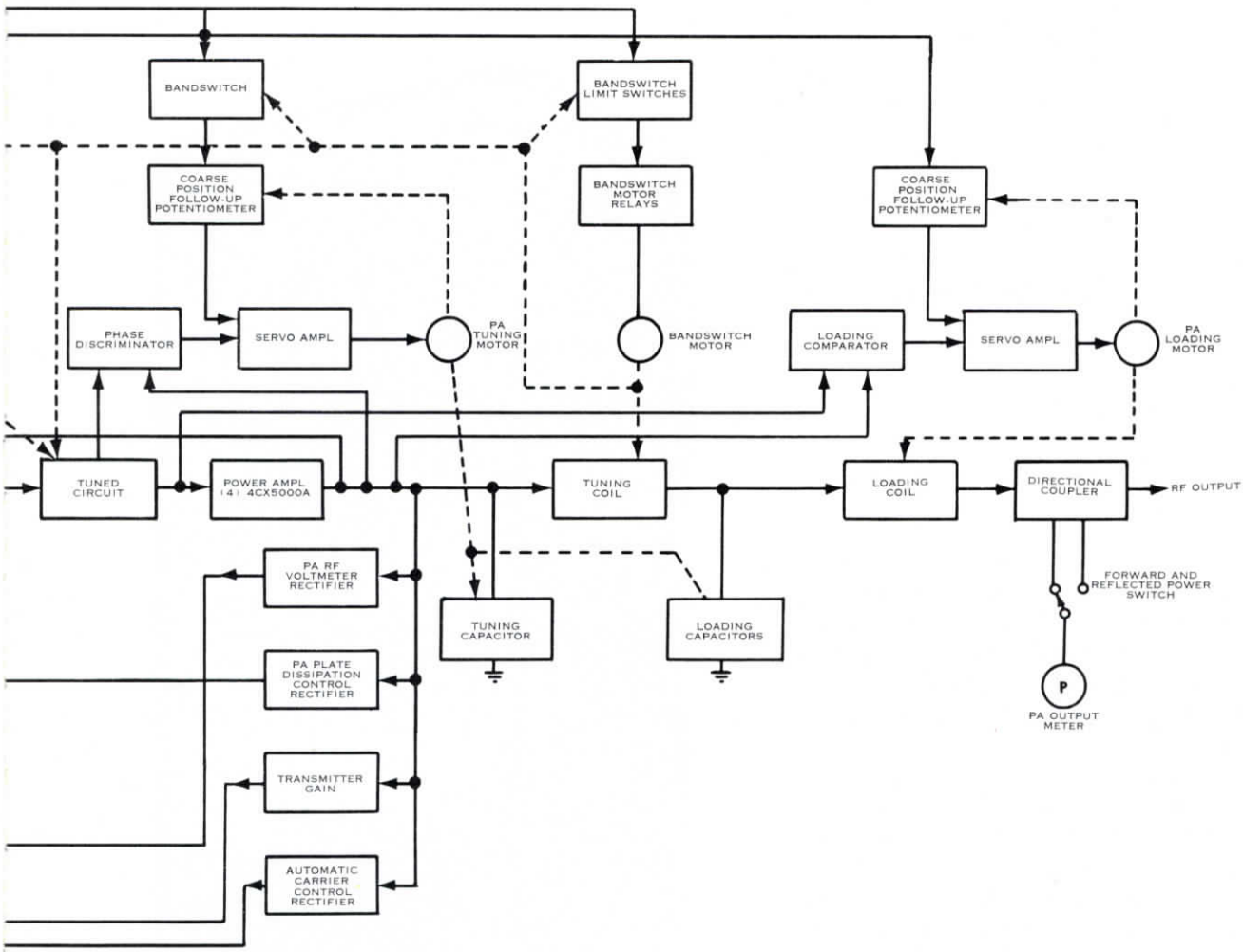
NOISE LEVEL: At least 50 db below either of two equal tones required to drive the power amplifier to 45 kw PEP output.

COOLING REQUIRED: Approximately 2000 cfm of air at a pressure of 0.4" water column, supplied by internally located centrifugal fan.

PRIMARY POWER: 195-255 v or 350-410 v, 3 phase, either 50 or 60 cps units can be supplied, 67 kva nominal, 0.95 pf for 45 kw PEP output, 2-tone test signal.

AMBIENT TEMPERATURE: —29° C to +52° C.

DUTY CYCLE: Continuous.



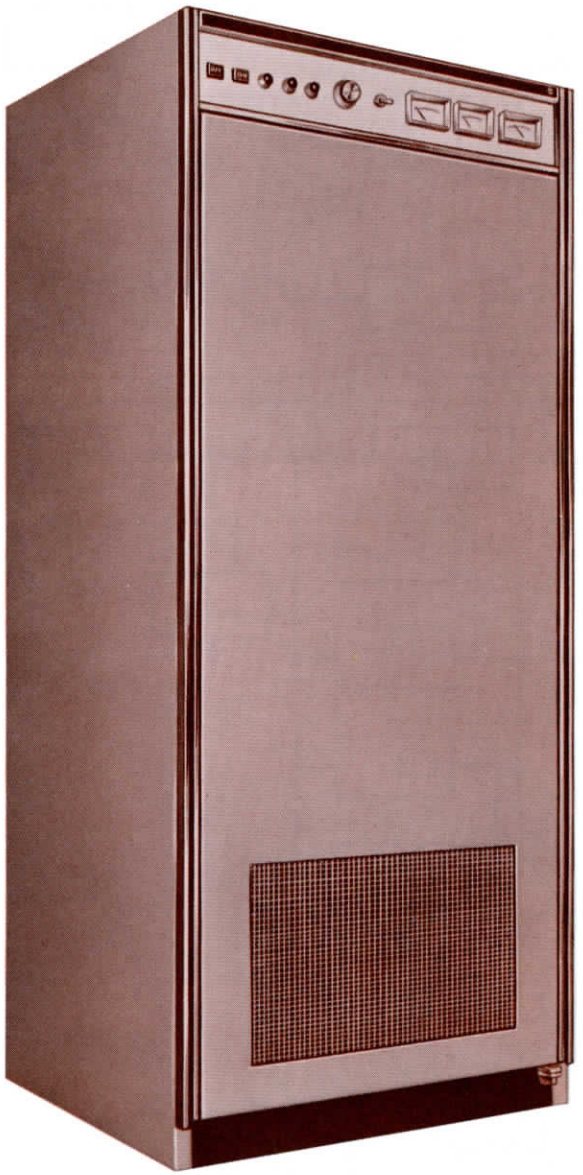
SIZE AND WEIGHT:

	Size W	H	D	*Weight*
205J-1 Power amplifier with power supply (over-all)	88¾″ 212.73 cm	78″ 198.12 cm	35½″ 90.17 cm	3137 lbs. 1422.94 kg
Plate transformer	18⅜″ 46.67 cm	32¾″ 83.19 cm	33⅜″ 84.77 cm	1040 lbs. 471.74 kg
Circuit breaker	16¼″ 41.28 cm	26¾″ 67.95 cm	17⅛″ 43.50 cm	146 lbs. 66.23 kg
Power supply control	17″ 43.18 cm	26¾″ 67.95 cm	9¼″ 23.50 cm	71 lbs. 32.21 kg
Centrifugal fan	30⅜″ 76.52 cm	32⅛″ 81.60 cm	21¼″ 53.98 cm	183 lbs. 83.01 kg

Related Equipment

310V-1 Exciter, p. 25-27*
651F-1 Receiver, p. 21-23
Antennas, p. 92-99
478R-1 Spectrum Analyzer, p. 130, 131
476D-1 Distortion Analyzer-Monitor, p. 130
**205J-1 requires special modification*

208U-3 3 KW HF Power Amplifier



Features	Applications
Automatic Tuning	*Fixed Station*
Low Intermodulation Distortion	*Transportable*
Low Spurious	*Shipboard*
Voltage-Regulated Supplies	
Remote Operation	

The 208U-3 is an automatically tuned linear power amplifier with 3 kw PEP output over the 2-30 mc frequency range. When used with an external exciter, such as the Collins 310V-1, and an antenna, it provides a complete HF transmitting system. Input power required is only 0.2 watt at the operating frequency.

Emission capability includes single sideband, CW or FSK signals. Several types of antennas can be accommodated. The 208U-3 operates from a 200-250 v, 47-420 cps, 3 phase primary power source.

Control functions are actuated by low voltage, direct current circuits. Dial-pulse control equipment is optionally available for remote operation over ordinary wire lines.

APPLICATION VERSATILITY

The 208U-3 is part of the Collins Universal Radio Group equipment and is ideally suited for fixed station, transportable or shipboard applications.

It is mounted in a rugged Unistrut frame to which doors, trim panels and meter-control panel may be added as required for custom configurations. Cabinet trim panels are available to completely enclose the power amplifier, to enclose the front, top and back or to enclose the front only, depending on installation requirements.

Installation is simplified since the RF and power supply units can be separated to permit passage through restricted space and then be reassembled.

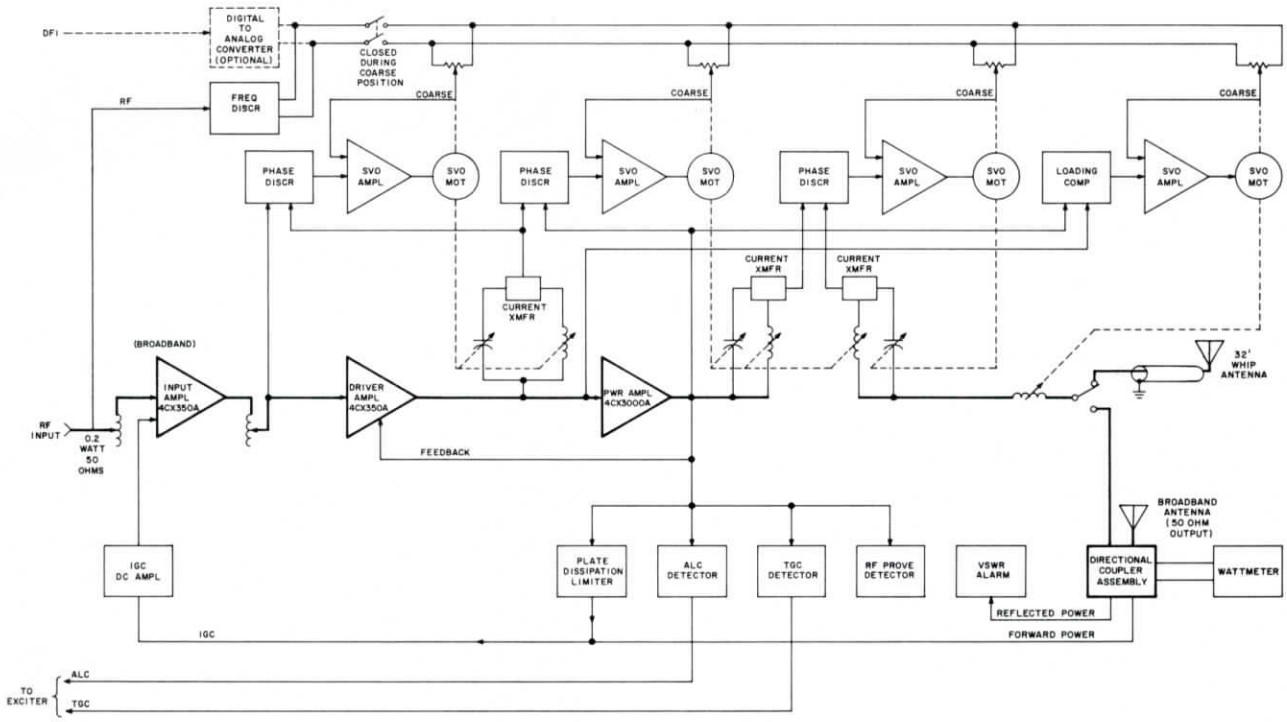
CIRCUIT FEATURES

A rapid, highly accurate automatic antenna tuning system requires only the RF signal from the associated exciter for frequency information. Shielded ceramic tetrode tubes contribute to excellent circuit stability and provide high gain with a minimum number of stages and tuned circuits. Fast operating, automatic tuning insures optimum linearity and peak power output at all frequencies. An efficient antenna network matches a wide range of antenna impedances.

Power supplies have automatic line voltage regulation. Long life silicon rectifiers with transient suppression are used in all power supply circuits.

Reliability is assured by the use of solid state components in all applicable circuits. All significant voltage, current and RF power levels are monitored by three meters. Voltage samples are readily available for external logging and optional fault alarm equipment.

Functional Circuits



Specifications

FREQUENCY RANGE: 2-30 mc.

POWER OUTPUT: 3 kw PEP or average.

DRIVE POWER: 0.2 watt PEP.

INPUT IMPEDANCE: 50 ohms.

OUTPUT IMPEDANCE: 50 ohms. Will accommodate up to 3:1 SWR. Will match at 32 ft. whip with accessory items.

OUTPUT INTERMODULATION DISTORTION: Third and higher order products at least 40 db below either of two equal test tones which drive the power amplifier to rated output.

OUTPUT HARMONIC CONTENT: All harmonic output is not less than 80 db below the fundamental power output measured on a 50 ohm load at any level up to rated power output.

TUNING TIME: Maximum, 10 seconds; nominal, 5 seconds. Tune failure information is provided if equipment should fail to tune within 15 seconds.

POWER SOURCE: 200-250 v, line to line, 3 phase, 47-420 cps. A primary power regulator automatically maintains the input voltage at 225 v.

POWER CONSUMPTION: Single tone CW at rated power, 7.5 kva. Two-tone at rated power, 4.3 kva. Power factor not less than 0.9.

AMBIENT HUMIDITY: 0%-95%.

ALTITUDE: 0-10,000 ft. operating; 0-50,000 ft. nonoperating.

VIBRATION: 5-15 cps 0.03″ double amplitude; 16-55 cps 0.02″ double amplitude or 1 g, whichever is less.

SHOCK: Each individual unit (RF and power supply subunits), when mounted in a suitable test frame, shall be capable of accepting 3 blows each direction in each of three planes for a total of 18 blows and each impact shall be 15 g maximum, 11 milliseconds in duration.

SIZE: 31 9/16″ W, 69″ H, 22⅜″ D (80.17 cm W, 175.26 cm H, 56.83 cm D).

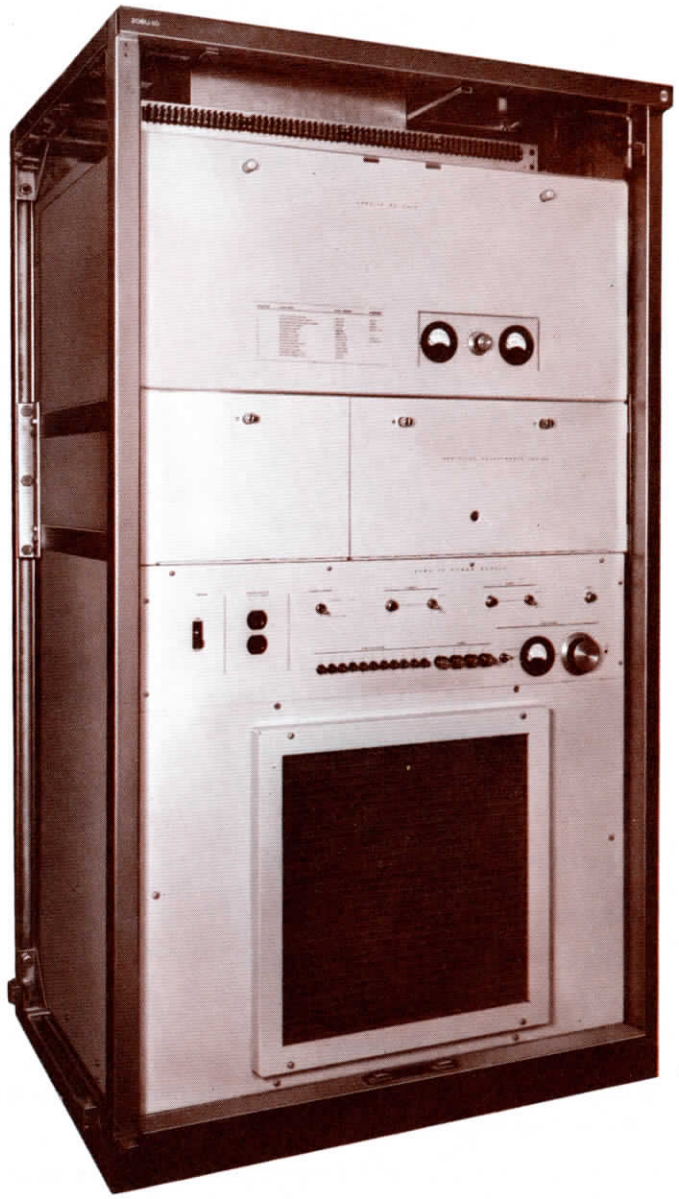
WEIGHT: Approx. 750 lbs. (340.2 kg).

Related Equipment

310V-1 Exciter, p. 25-27
313 Series Controls, p. 83-85
Antennas, p. 92-99
476D-1 Distortion Analyzer-Monitor, p. 130
478R-1 Spectrum Analyzer, p. 130, 131
184U-10 RF Matrix Uniswitch, p. 106, 107
651F-1 Receiver, p. 21-23

208U-10 10 KW Power Amplifier

Features	Applications
Automatic Tuning	*Fixed Station*
Integral Shielding	*Transportable*
Efficient Cooling	*Shipboard*
Unattended Operation	
Front Accessibility	
Application Groups	



The 208U-10 is an automatically tuned, 10 kw HF linear power amplifier which covers the 2-30 mc frequency range. It will linearly amplify SSB, AM, CW, FSK or any other type of signal within the specified bandwidth and power capabilities. Tuning is normally completed within 10 seconds and never exceeds 25 seconds. The 208U-10 will tune into a 50 ohm broadband antenna without an antenna coupler. Drive power required from an associated exciter is only 0.2 watt PEP. The 208U-10 is part of the Collins Universal Radio Group equipment which can be selected to meet a wide range of communication requirements.

The 208U-10 is equally well suited for fixed station, transportable or shipboard installations. Heavy components are mounted on a solid aluminum base-casting to give superior structural characteristics under shock and vibration conditions. The AN/TSC-38 HF Communication System is a typical transportable application of the 208U-10 Power Amplifier. Optional cabinet styles, cooling and input power requirements permit its use in a wide range of applications without degradation of performance.

AUTOMATIC TUNING

A rapid, highly accurate automatic tuning system requires only the RF signal from the associated exciter for frequency information. Reliability is increased by the use of solid state servo amplifiers.

CERAMIC TETRODE TUBES

Compact, well shielded ceramic tetrode tubes provide high gain with a minimum number of stages and contribute to excellent circuit stability.

DC REMOTE CIRCUITS

Function control circuits employ low voltage direct current and can be used with telephone type termination facilities for unattended remote operation.

INTEGRAL SHIELDING

Very low conducted and radiated interference levels have been achieved by the use of integral shielded compartments and adequate filtering for each RF stage.

EXTENDED RELIABILITY

Simplified circuitry with a minimum number of stages and tuned circuits increases reliability. Solid state components are used wherever applicable to insure reliability. Long life silicon rectifiers, together with efficient transient suppression circuits, are employed in power supplies. All components are rated for continuous operation at the highest specified temperatures. A high capacity blower insures adequate cooling even in high altitude environments.

CUSTOM CONFIGURATIONS

The 208U-10 is mounted in a rugged Unistrut frame with removable exterior panels to facilitate use in custom configurations and to simplify installation in transportable shelters or in shipboard radio rooms. In shipboard applications the final

RF amplifier can be separated from the power supply to facilitate handling through a restricted passage, and it can then be quickly reassembled.

APPLICATION GROUPS

The following application groups are available: trim panels for single or multiple installation, modified location of cooling-air inlet and exhaust, a choice of primary power sources, automatic filament voltage regulation, primary power line filters and automatic RF voltage control.

Trim Options The exterior cabinet panels and meter panel snap or bolt on and can be installed initially or added later to provide integrated styling with other related equipments. Trim panels are not supplied with the basic power amplifier; instead, optional application groups are selected to meet individual customer requirements.

Cabinet trim is available to completely enclose the power amplifier, to enclose the front, top and back, or to enclose the front only. Partial enclosure of the front, top and back is for the middle units of a multiple power amplifier installation. The front trim group is for transportable hut or van installations where the top, back and sides of the power amplifier are adjacent to other equipment, walls or ceiling.

Each of the trim groups is available with either a meter-control panel or a styled blank panel to complete the front enclosure. The meter-control panel is for applications that require local operational adjustments and power-level control, while the blank panel is used in remotely controlled installations.

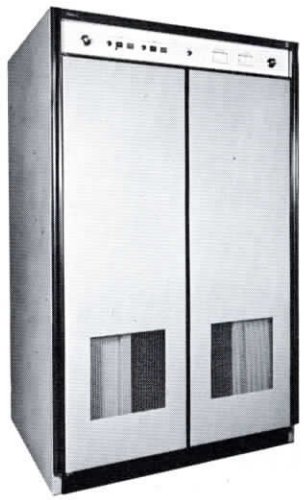
Cooling Air Options The 208U-10, as supplied, has a front air inlet with filter and a top air outlet. A rear air intake application group with external filtering is available for installations where the ambient room air cannot be used for cooling. In transportable installations with low ceilings, an application group allows air to be exhausted from the top-rear without extension of the power amplifier height.

Power Source Options The 208U-10 is normally supplied to operate from a 195-255 v, 47-63 cps, 3 phase power source. Application groups are available for operation from either a 195-255 v, 400 cps, 3 phase power source, or a 380 v or 440 v, 50-60 cps, 3 phase, 4-wire wye power source.

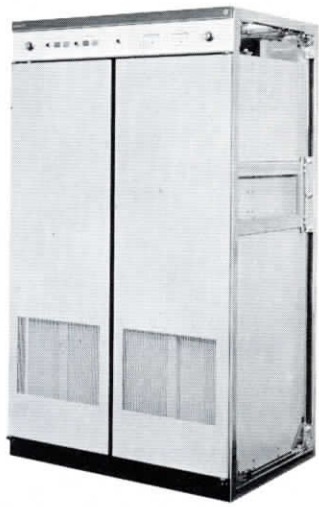
Filament-Voltage Regulator Option An automatic filament-voltage regulator application group will maintain the filament voltages within $\pm 1\%$ for line voltage changes of $\pm 10\%$.

AGC Option An automatic gain control application group can be added for operation with exciters which do not have external gain control provisions.

Interference Suppression Option The 208U-10 meets all ordinary conducted RF interference requirements over the 90 kc to 30 mc range but in some applications additional attenuation may be desired. An application group of three power-line filters for 195-255 v, 50-60 cps or 400 cps power-line sources will provide a minimum additional attenuation of 45 db from 150-500 kc and 65 db from 500 kc to over 100 mc.

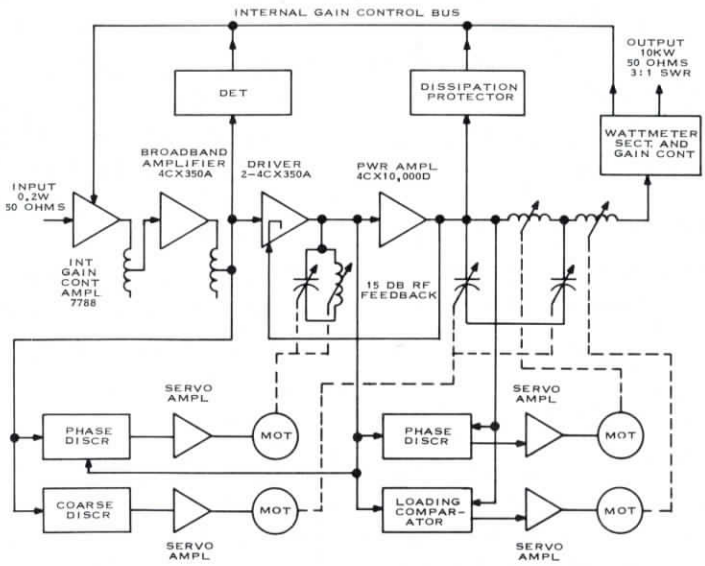


Complete Trim Group



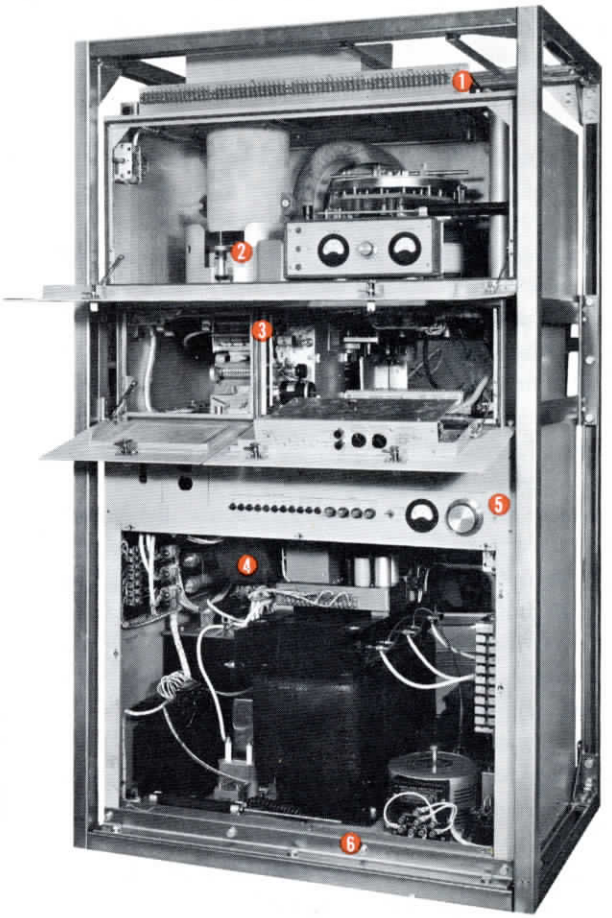
Front and Top Trim Only

Functional Circuits



Design Highlights

1. *Centralized System Connections*
2. *Ceramic Tetrode Tubes*
3. *Excellent RF Shielding*
4. *High Capacity Blower*
5. *Simplified Controls*
6. *Aluminum Base Casting*



Specifications

FREQUENCY RANGE: 2-30 mc.

POWER OUTPUT: 10 kw PEP or average.

DRIVE POWER: 0.2 watt PEP.

INPUT IMPEDANCE: 50 ohms.

OUTPUT IMPEDANCE: 50 ohms, with up to 3:1 SWR (2.5-30.0 mc); 2:1 SWR (2.0-2.5 mc).

INTERMODULATION DISTORTION: All odd order distortion products at least 35 db below one of two equal tones which drive the power amplifier to 10 kw PEP.

HARMONIC CONTENT: Second harmonic at least 55 db down. Higher order harmonics at least 60 db down.

TUNING TIME: Less than 25 seconds.

POWER CONSUMPTION: Single tone CW at rated power — 22 kva; two-tone test—20 kva. Power factor not less than 0.9.

POWER SOURCE: 195-255 v with 2% regulation, 47-63 cps, 3 phase. Taps provided for line voltage compensation. Available for operation from 380 v or 440 v, 50-60 cps, 4-wire wye connection, or 200-250 v, 380-420 cps, 3 phase power sources on special order.

AMBIENT HUMIDITY: 0%-95%.

ALTITUDE: 0-10,000 ft. operating; 0-50,000 ft. nonoperating.

VIBRATION: 5-15 cps 0.03″ durable amplitude. 16-55 cps 0.02″ double amplitude or 1 g whichever is less.

SHOCK: Each individual unit, when mounted in suitable test frame, shall be capable of accepting 3 blows each direction in each of 3 planes for a total of 18 shocks, and each impact in the vertical plane shall be 30 g, 11 milliseconds in duration, and each impact in the horizontal plane shall be 15 g, 11 milliseconds in duration.

SIZE: Without trim — 39¾″ W, 69″ H, 27¼″ D (1.01 meters W, 1.75 meters H, 0.69 meter D).

WEIGHT: Approx. 1650 lbs. (748.44 kg).

Related Equipment

310V-1 Exciter, p. 25-27
635W-1 Harmonic Filter, p. 113
313 Series Controls, p. 83-85
Antennas, p. 92-99
476D-1 Distortion Analyzer-Monitor, p. 130
478R-1 Spectrum Analyzer, p. 130, 131
184U-10 RF Matrix Uniswitch, p. 106, 107
651F-1 Receiver, p. 21-23

548L-4 1 KW HF Power Amplifier

Features	Applications
Automatic Tuning	*Fixed Station*
Low Spurious	*Mobile*
Compact Packaging	*Transportable*
Maximum Accessibility	*Airborne*
	Shipboard

The 548L-4 is a compact power amplifier with a 1 kw PEP or average output in the 2.0-29.9999 mc range.

It features automatic tuning, using tuning information in 0.1 kc increments. Tuning time is 2-3 seconds nominal, 10 seconds maximum.

Required drive is 0.2 watt PEP maximum on the channel frequency. Over-all gain is within 3 db over the operating range and within 1 db for a signal bandwidth of not less than ±7 kc of the center frequency. When used with an exciter, such as the Collins 310V-1, and an antenna, it provides a complete HF transmitter. The 548L-4 is part of the Collins Universal Radio Group of building block equipments, which can be selected to meet a wide range of communication system requirements.

ADVANCED CIRCUITRY

The RF circuits consist of a two-stage amplifier with over-all inverse feedback. Two 7551 tubes are used to drive four parallel 4CX350F's. The output passes through a directional wattmeter circuit for transmission line VSWR indication.

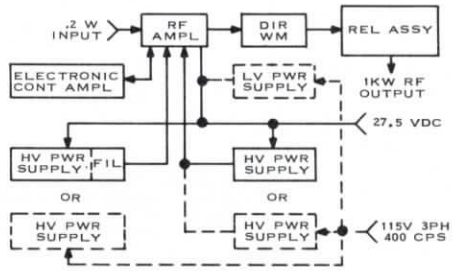
FLEXIBLE INSTALLATION

The 548L-4 is housed in an ARINC 404 1 ATR size case which can be easily mounted in a Unistrut or other type rack for flexibility in configuration. Forced air cooling permits it to be used over a wide range of ambient temperatures.

The 548L-4 Power Amplifier is equally applicable to fixed station, shipboard, airborne and surface or air transportable systems. It can be used in continuous duty applications with either attended or unattended operation through local, remote or telephone dial control. All frequency control functions are accomplished by grounds on wires using a two-out-of-five frequency code.

The 548L-4 is available with either an ac or dc power supply and with or without a transmit-receive relay.

Functional Circuits



Specifications

FREQUENCY RANGE: 2.0-29.9999 mc.

TUNING: Automatic, continuous coverage.

TYPES OF SIGNALS: Any, within bandwidth capability.

RF INPUT: 0.2 watt PEP maximum for rated PEP output.

TUNING TIME: Not more than 10 seconds maximum.

OUTPUT DISTORTION: Third and higher order distortion down at least 35 db from either tone in a standard two-tone test.

HARMONIC EMISSION: Suppressed at least 35 db below PEP output level.

OUTPUT IMPEDANCE: 50 ohms unbalanced.

OUTPUT LEVEL: 1000 watts ±2 db PEP or average with rated input level.

COOLING REQUIREMENTS: Forced air with 460 lbs. per hour at 1″ water pressure minimum.

POWER REQUIREMENTS: 22.0-30.25 v dc (27.5 v nominal) negative grounded with no more than 0.5 v ripple, 450 watts standby and 3000 watts maximum keyed; also available for operation with 120 v or 208 v power source, 400 cps, 3 phase.

SIZE: 10⅛″ W, 7⅝″ H, 19 9/16″ D (25.72 cm W, 19.37 cm H, 49.69 cm D).

WEIGHT: 52 lbs. (23.6 kg).

Related Equipment

310V-1 Exciter, p.25-27
426U-2 Power Supply, p. 86
Antennas, p. 92-99