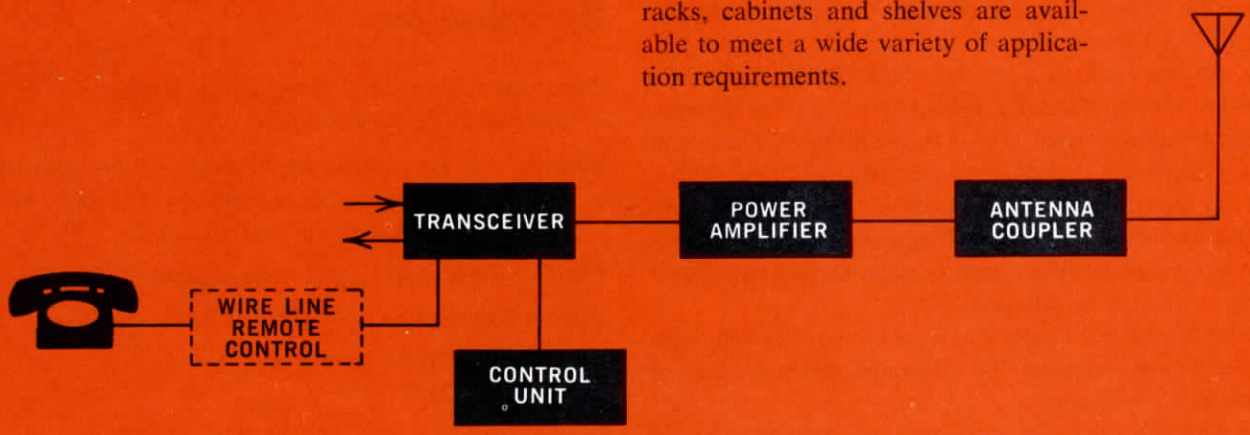
Universal Radio Group

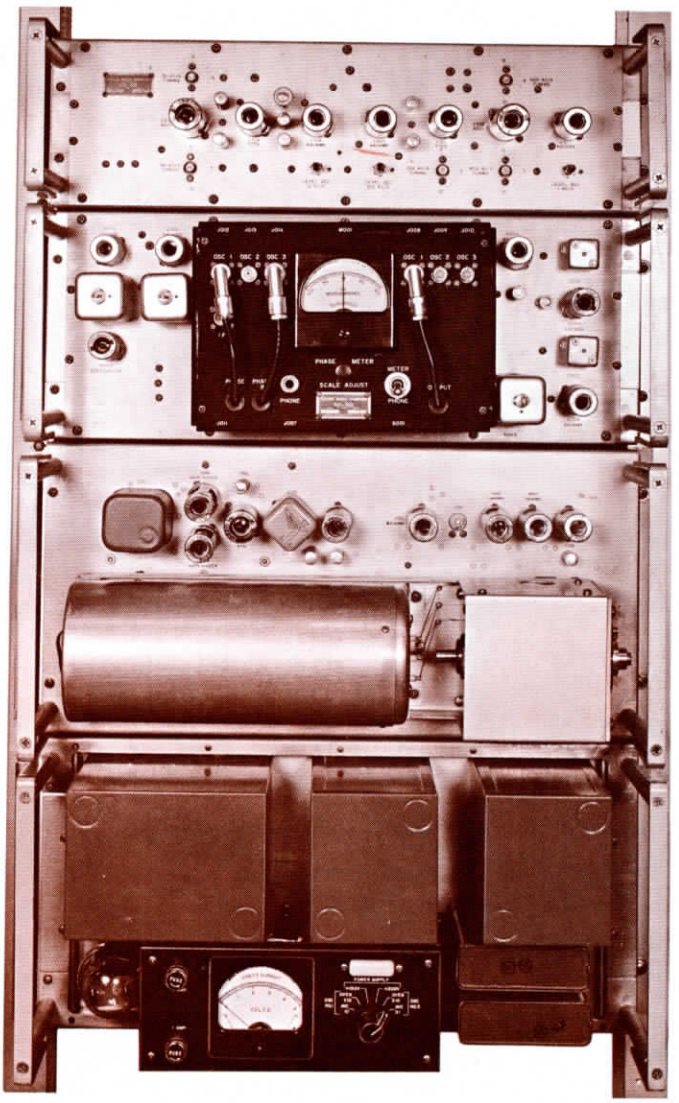
The Collins Universal Radio Group is an advanced line of automatically tuned HF communication equipment based upon a building block concept which gives it a new degree of flexibility, versatility and logistic commonality.

Units can be selected to provide transmitters, receivers or transceivers with local, remote or dial telephone control capabilities. URG equipment is equally well suited for fixed station, transportable, shipboard and airborne applications — and without the extra fabrication costs and long lead time normally involved in tailoring equipment for these installations.

The equipment is of a modular design, with the smaller units housed in ARINC (Aeronautical Radio, Inc.) type enclosures. Shelves of this equipment, as well as the larger power amplifiers, are mounted in rugged Unistrut racks with optional enclosure panels. Attractive racks, cabinets and shelves are available to meet a wide variety of application requirements.



40N-1,-2 Frequency Standards



Features

Frequency Accuracy
Amplitude Stability
Minimum Harmonics
Centralized Metering

Applications

Fixed Station
Shipboard
Data Transmission

The 40N-1,-2 Frequency Standards provide 1 mc, 100 kc and 10 kc outputs with no appreciable harmonics and a stability of one part in 10^8 per day minimum. They are excellent for supplying reference signals in a wide range of fixed station and shipboard applications.

Both standards are particularly suited for use with HF receivers and exciters, such as Collins' AN/URC-32 and Collins' Universal Radio Group equipment. The 40N-1,-2 are equally suited for use in laboratories or other communication systems as base frequency standards.

The 40N-1 consists of three rack mounted units — a 40K-1 Oscillator, which generates the highly stable 1 mc signal; an 8U-1 Frequency Divider, which supplies simultaneous 1 mc, 100 kc and 10 kc outputs from the basic 1 mc signal; and a 426A-1 Power Supply.

The 40N-2 is a dual frequency standard which includes three 40K-1's, two 8U-1's and a 54M-1 Frequency Comparator, together with associated 426A-1 Power Supplies. The output signals of the 40K-1 Oscillators are compared in the 54M-1, and any two of the three can be selected independently, permitting maximum assurance of frequency accuracy. The difference between any two signals is indicated on a front panel meter or through headphones.

The use of a rugged 1 mc resonator at low power levels, rather than the conventional 100 kc circuit, eliminates normal susceptibility to shock.

Both the 40N-1 and 40N-2 mount in 19″ equipment racks, and all units are of matching mechanical design. All power and coaxial RF cables terminate at the rear of the units. Tubes and adjustments are accessible from the front of each unit by removing the snap-on dust cover.

Specifications

FREQUENCY STABILITY: One part in 10^8 per day minimum; one part in 10^9 per day typical.

OUTPUT: 1 mc — 0-2 v rms. 100 kc — 0-5 v rms. 10 kc — 0-5 v rms. 40N-1 — one independent frequency. 40N-2 — best two of three independent frequencies.

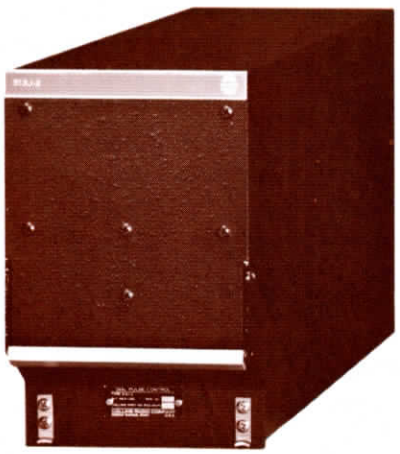
OUTPUT IMPEDANCE: 500 ohms nominal. BNC connectors.

POWER REQUIREMENTS: 115 v or 230 v, 50-60 cps.

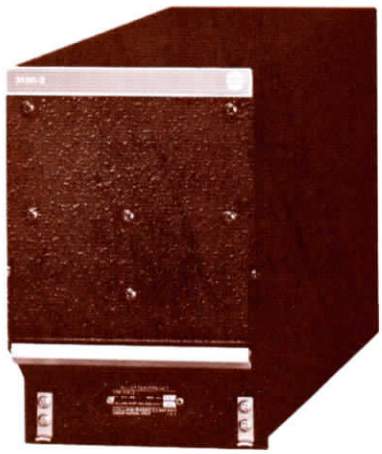
SIZE AND WEIGHT (excluding rack):

	Size			*Weight*
	W	*H*	*D*	
40N-1	19″ 48.26 cm	22¾″ 57.59 cm	7″ 17.78 cm	66 lbs. 29.94 kg
40N-2	19″ 48.26 cm	79″ 200.66 cm	7″ 17.78 cm	190 lbs. 86.18 kg

313J-2, 313K-2 and 313L-1 Control Equipment

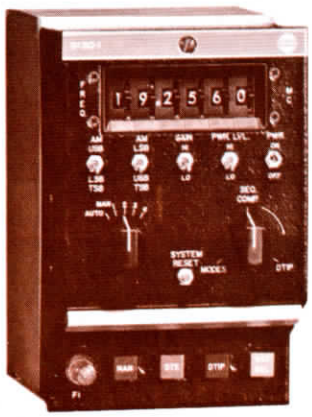


313J-2 Dial Pulse Control



313K-2 Allotter-Preset

313L-1 Frequency Register



313Q-1 Control Unit

Features

Dial-Pulse Control
Installation Flexibility
Modular Construction
Telephone Compatibility
Complete Remote Operation

Applications

Fixed Station
Transportable

The 313J-2, 313K-2 and 313L-1 Control Units allow complete remote operation of an unattended URG installation over landlines, microwave or a radio link by simple telephone dialing. The control units are part of the Collins Universal Radio Group, a family of integrated building block equipment which permits a selection of units to meet a specific communication requirement. In addition to fixed station application it is suitable for transportable systems, such as the AN/TSC-38.

SIMPLIFIED OPERATION

By dialing the proper predetermined number code groups, the operator can turn on and off the primary power to the equipment, select such functions as operating frequency, mode, receiver gain, transmitter power levels, and can choose an antenna and antenna azimuth if steerable antenna is employed. Other functions are also available as options in the URG equipment.

An automatic switchboard can be used in a radio-telephone exchange system to interconnect with audio circuits originating from either landline or radio to the HF URG facilities. Subscriber control of the system can be effected from any of the connected dial telephones.

PRESET CHANNELS

The most frequently used radio conditions on a particular channel are available by simply lifting the subscriber's handset from its base. The 313K-2 stores preset operating information for ten specified operating conditions which can be applied to any of four radio channels. If the channel is in use, it will not handle a request until termination of processing the previous request.

The normal-preset channel can be obtained from a 714Y, a local manual control unit, or one of the presets in the 313K-2, depending on the interconnection of control equipment. The

normal-preset condition automatically tunes the radio equipment to the preset frequency.

When radio tuning is completed, the user is provided with an audible function-complete signal indicating the system is ready for operation.

BASIC CONTROL UNITS

Remote operation of a URG system is accomplished by the proper combination of three basic radio control units. The 313J-2 Dial Pulse Control decodes incoming telephone dial pulses to select the desired control function and routes dial pulses through the 313K-2 Allotter-Preset to the 313L-1 Frequency Register for frequency information. Azimuth information from the 313J-2 is supplied to the antenna switching matrix. The 313J-2 also provides operating mode information to the HF radio equipment and generates appropriate supervisory signals.

MODULAR CONSTRUCTION

The control equipment is of plug-in modular construction, housed in ARINC ATR-type cases which mount directly on an equipment shelf. Power and control connections are made through self-aligning connectors at the rear of each unit. Units are nonpressurized and dust and explosion proof; no cooling air is required.

313J-2 DIAL PULSE CONTROL UNIT

Operating functions of an individual HF radio channel to be controlled over ordinary telephone lines are housed in the 313J-2. The dial-pulse control unit decodes the serial dial pulses or FSK tone information received over the telephone lines and distributes the control signal directly to the primary radio equipment or to the other control equipments to enable them to perform the functions requested by the operator.

In addition, the dial-pulse control unit generates audible supervisory tone signals, such as continue-dialing, function-complete, busy, tuning-in-progress, and antenna-rotating. These supervisory tones are applied to the telephone circuit to keep the operator informed of the functional status of the equipment.

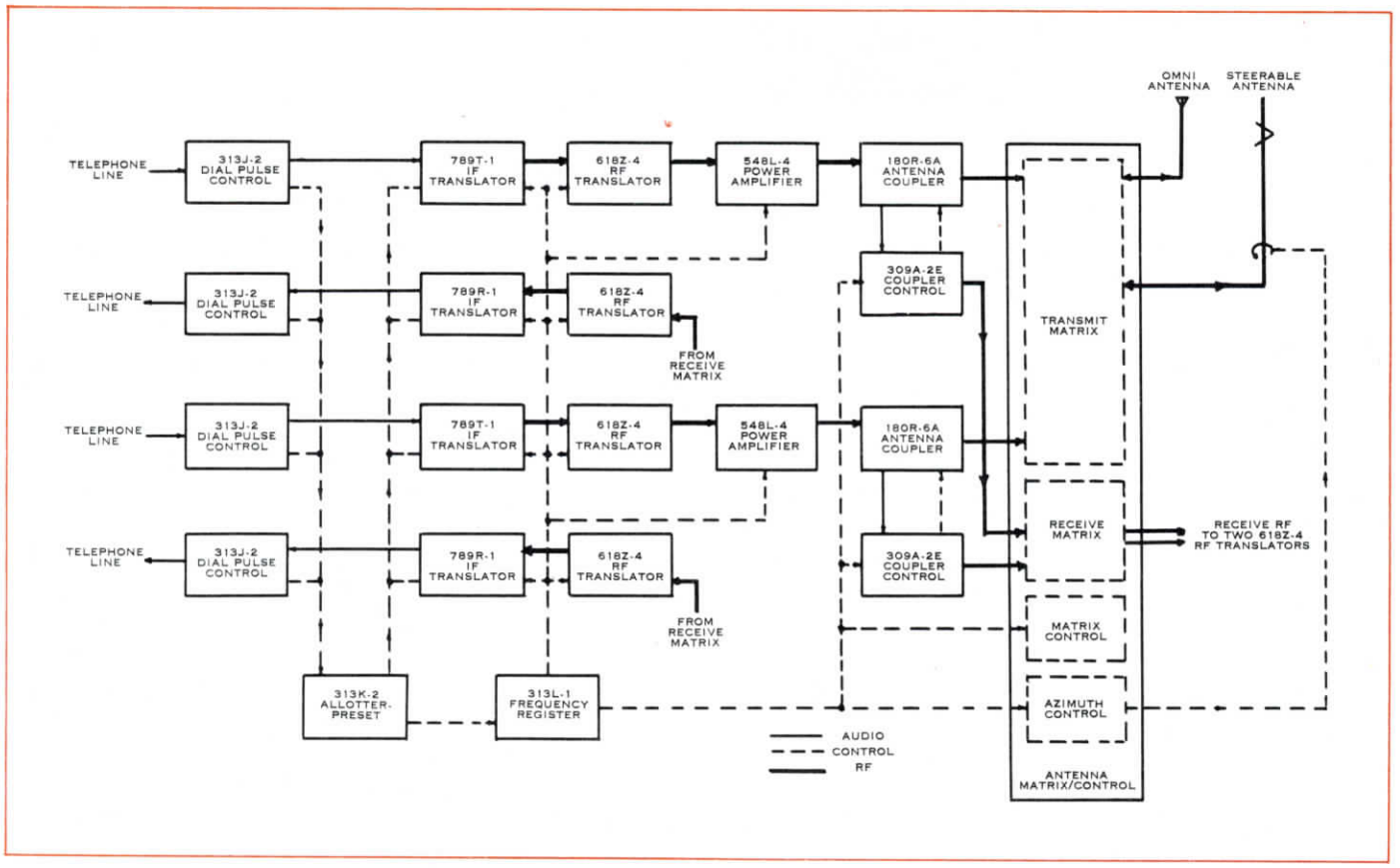
313K-2 ALLOTTER-PRESET

The allotter-preset is used in URG systems which involve more than one group of receive and transmit equipment or which require presets. The allotter circuits control and route signals for the use of time-shared control units, such as the 313L-1 Frequency Register in the communication system, while the preset section provides automatic selection of ten presets controlling mode, frequency and antenna. Preset channels are selected by simply dialing a number. Each unit will accommodate up to four subscribers.

313L-1 FREQUENCY REGISTER

Frequency information in serial dial-pulse form is converted by the 313L-1 to parallel code, using two-out-of-five wires for actuating the associated radio equipment tuning mecha-

Functional Circuits



nisms. The frequency register output circuits are armed by a signal from the 313K-2 Allotter-Preset unit, with subsequent dial pulses representing the frequency information. Frequency requests outside of the 2.0-29.999 mc range will actuate a busy signal. In a typical system, the 313L is available to individual channels on a time-shared or demand basis.

Typical URG System Control Codes

FUNCTION	DIALED CODE ON INPUT TELEPHONE PAIR
Steerable antenna selection	Two digits indicating the desired azimuth in 30° steps, 03, 06, 09, 12, 15, 18, 21, 24, 27, 30, 33, 36.
Omni antenna selection	Digit 4 plus digit 1.
Frequency selection	Digit 5 plus the digits of the desired frequency. In 100 cycle steps, 020,000 to 299,999.
Mode selection:	
Sideband selection	Digit 6 plus digit 1 for USB or digit 2 for LSB.
Twin sideband selection	Digit 6 plus digit 3.
Power ON-OFF	Digit 6 plus digit 0 for off or digit 9 for on.
AM selection	Digit 6 plus digit 4.
RF gain selection	Digit 6 plus digit 5 for low gain or digit 6 for high gain.
Power level selection	Digit 6 plus digit 7 for low power or digit 8 for high power.
Preset selection	Digit 7 plus any digit from 0 to 9 representing the number of the preset desired.
Miscellaneous 1*	Digit 8 plus the digits of the desired frequency. In 100 cycle steps, 020,000 to 299,999.
Miscellaneous 2*	Digit 9 plus any digit from 0 to 9 representing the number of the preset desired.

*Option: For duplex operation, the digit 8 will be used for transmitter frequency selection and the digit 9 for transmitter preset selection.

313Q-1 CONTROL UNIT

The 313Q-1 permits manually switched selection of frequency and mode of transmission, on-off control, and gain control of four different transceivers in a system using the 313J, 313K and 313L remote control equipments. All the supervisory tones present in the automatic system serve the same functions in an installation using the 313Q-1 Control Unit. Selection of any of 280,000 channels with 0.1 kc spacing over the 2.0-29.9999 mc range is indicated by a direct, digital readout of the operating frequency. All frequency selection terminations are diode isolated for 500 ma current to allow paralleling of control units.

The 313Q-1 Control is part of the Collins Universal Radio Group, a family of HF building block equipment which offers a choice of units to meet any communication requirement.

Size: ½ ATR; 5″ W, 7 11/16″ H, 10 3/32″ D (12.7 cm W, 19.53 cm H, 25.64 cm D), *Weight:* 6 lbs. (2.72 kg).

Specifications

POWER REQUIREMENTS (maximum):

313J-2 Dial Pulse Control	27.5 v dc, 5 amps
313K-2 Allotter-Preset	27.5 v dc, 2 amps
313L-1 Frequency Register	27.5 v dc, 2 amps

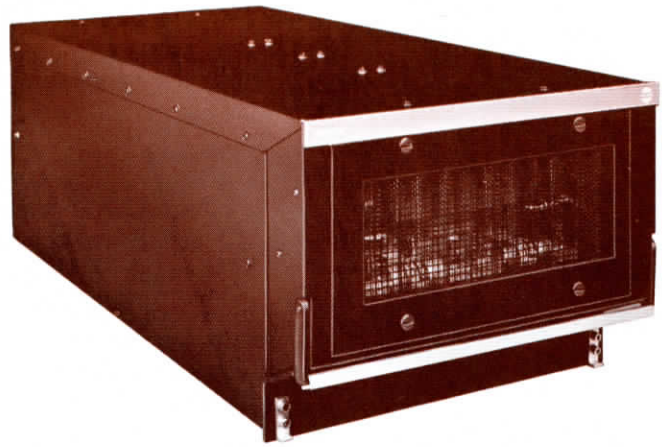
SIZE AND WEIGHT:

	Size			*Weight*
	W	*H*	*D*	
313J-2 dial pulse control	4⅞″ 12.38 cm	7⅝″ 19.37 cm	19 9/16″ 49.69 cm	27½ lbs. 12.47 kg
313K-2 allotter-preset	4⅞″ 12.38 cm	7⅝″ 19.37 cm	19 9/16″ 49.69 cm	19 lbs. 8.62 kg
313L-1 frequency register	2¼″ 5.72 cm	7⅝″ 19.37 cm	19 9/16″ 49.69 cm	14 lbs. 6.35 kg

Related Equipment

Racks and Cabinets, p. 91

426U-2 27.5 V DC Power Supply



Features

AC or DC Input
Adjustable Output
Excellent Regulation
Parallel Operation
Solid State
Circuit Protection

Applications

Fixed Station
Transportable
Shipboard
Mobile
Airborne

The 426U-2 is a compact, lightweight power supply which provides 27.5 v, 100 amps nominal dc output from a variety of ac or dc power sources. A variable output current limit control provides maximum current settings between 75 amps and 125 amps. Any number of 426U-2 Power Supplies can be operated in parallel.

APPLICATION

The 426U-2 is part of the Collins Universal Radio Group of HF equipments and is intended for use with the 548L-4 Power Amplifier. It is also well suited for use with other equipments requiring a 27.5 v highly regulated, high current input. The unit can be installed either in a Unistrut equipment rack or an attractive cabinet enclosure.

HIGH RELIABILITY

Solid state components are used throughout for minimum size and maximum reliability. Protective circuits include overload, undervoltage and loss of cooling air, together with fault indicator and remote alarm. The 426U-2 will not be damaged during current overload or short circuit conditions, and normal system operation is quickly restored when the overload is removed.

INSTALLATION

The 426U-2 mounts in an externally cooled, ARINC Specification 404, 1 ATR tray. All power terminations are made through a single rear connector. The washable air filter, test points, over-current control and output voltage control are accessible by removing the front panel insert.

Specifications

INPUT POWER: 90-140 v, line to neutral ac, 45-450 cps, single phase 3-wire, or 3 phase 4-wire; or 90-140 v dc. Overvoltage may be 150 v, line to neutral ac for 90 milliseconds maximum duration. Undervoltage to 0 level without damage to the power supply.

OUTPUT VOLTAGE: 27.5 v dc nominal, 100 amps.

VOLTAGE CONTROL: Continuously variable from 24-29 v dc.

VOLTAGE REGULATION: ±0.5 v from 0-100 amps.

RIPPLE VOLTAGE: Less than 0.25 v rms from 5-100 amps.

LOAD TRANSIENTS: Less than ±1.5 v output variation for a step of 15-90 amps or 90-15 amps.

OVERVOLTAGE: Power supply will shut off if output voltage exceeds 33 v ±2 v for 100 milliseconds.

OVERLOAD PROTECTION: Maximum output current adjustable from 75-125 amps. Overload conditions reduce the output voltage to a level which limits the current to the overload setting. Normal operation is restored upon removal of overload.

EFFICIENCY: 75% minimum at 100 amps output.

TEMPERATURE RANGE: −40° C to +50° C operating; −62° C to +85° C nonoperating.

HUMIDITY: 0%-100%, operating or nonoperating.

ALTITUDE: 0-50,000 ft. operating.

COOLING REQUIREMENTS: 220 lbs. per hour minimum with maximum output over the above temperature range. Requires 150 lbs. per hour at 20°-30° C.

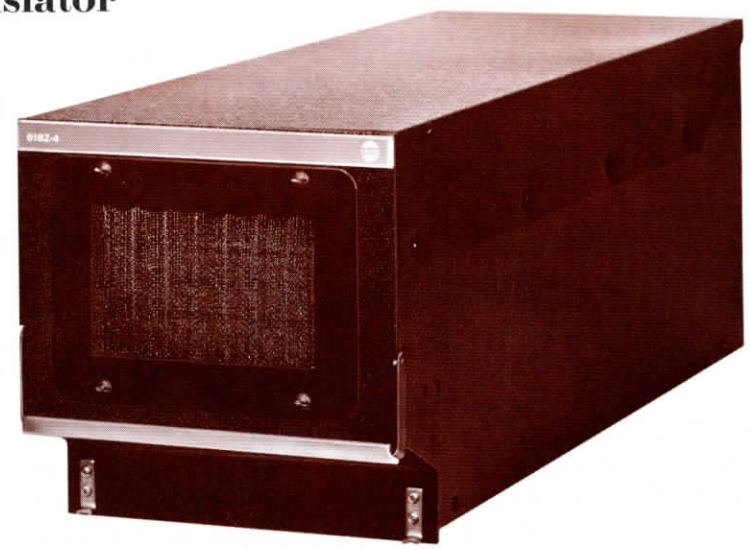
SIZE: 10½″ W, 7⅝″ H, 19 9/16″ D (26.67 cm W, 19.37 cm H, 49.69 cm D).

WEIGHT: 83.5 lbs. (37.88 kg).

Related Equipment

Racks and Cabinets, p. 91
548L-4 1 KW Power Amplifier, p. 37

618Z-4 RF Translator



Features	Applications
Automatic Tuning	*HF Receiver*
Installation Flexibility	*HF Exciter*
Modular Construction	*HF Transceiver*
Remote Operation	

The 618Z-4 RF Translator is the building block in Collins' Universal Radio Group containing the stages which perform the conversions between the intermediate frequencies and the desired operating frequencies in the HF range.

In transmission, the 618Z-4 translates the 500 kc signal from a 789 series IF translator to the desired channel frequency in the 2.0-29.9999 mc range; this signal is amplified to a 0.4 watt PEP level for the input signal to a URG power amplifier. In reception, the 618Z-4 converts the incoming RF signal to the 500 kc frequency required by the associated IF translator. Tuning is automatic.

Typical configurations in which the 618Z-4 RF Translator appears include the 310V-1 Exciter, 651F-1 Receiver and 671B-1 Receiver-Exciter.

CIRCUIT FEATURES

All circuitry with the exception of the RF tuner employs transistors. Careful design consideration has been given to reduction of both conducted and radiated interference. Modular construction facilitates maintenance and equipment support programs.

Plug-in power supplies allow operation from either 27.5 v dc or 115 v or 230 v, 45-450 cps sources. The power supplies use solid state components which are protected against both excessive potentials and high negative transients.

Function and frequency selection is accomplished by a small control unit, such as the Collins 714Y, using two-out-of-five wire coding. A memory circuit retains frequency selection information to allow common sharing of dial-pulse control equipment for remote operation.

OPTIONAL FREQUENCY STANDARD

Two choices of frequency control are available. One uses an internal reference standard of one part in 10^8 per day; the other employs a highly stable external standard for data handling, or other applications requiring exceptionally high stability. Translator frequency determining circuits are phase locked to the standard.

Specifications

FREQUENCY RANGE: 2.0-29.9999 mc.

FREQUENCY CONTROL: Phase locked to internal frequency standard; provision for optional use of external 100 kc frequency standard.

FREQUENCY STABILITY: Internal standard — one part in 10^8 per day (aging rate); rms stability factor does not exceed one part in 10^8 in any 10-minute period.

INPUT CIRCUIT: 50 ohms unbalanced.

OUTPUT CIRCUIT: Transmit — 50 ohms unbalanced.
Receive — 25 ohms unbalanced.

RF OUTPUT: Exciter — 0.4 watt PEP minimum.

COOLING REQUIREMENTS: Air cooled; requires minimum of 100 lbs. per hour at 0.5″ of water pressure. An optional cooling unit is available for mounting with a plenum shelf.

POWER REQUIREMENTS: 22.0-30.25 v dc (27.5 nominal) negative grounded with less than 0.5 v ripple, 170 watts maximum, or 115 v or 230 v, 45-450 cps.

SIZE: 7½″ W, 7⅝″ H, 19 9/16″ D (19.05 cm W, 19.37 cm H, 49.69 cm D).

WEIGHT: 30 lbs. (13.61 kg).

Related Equipment

789R-1 IF Translator, p. 88-90 *789X-1 IF Translator, p. 88-90*
789T-1 IF Translator, p. 88-90 *Racks and Cabinets, p. 91*

789R-1, 789T-1 and 789X-1 IF Translators

Features	Applications
Automatic Tuning	*HF Receiver*
Installation Flexibility	*HF Exciter*
Modular Construction	*HF Transceiver*
Remote Operation	

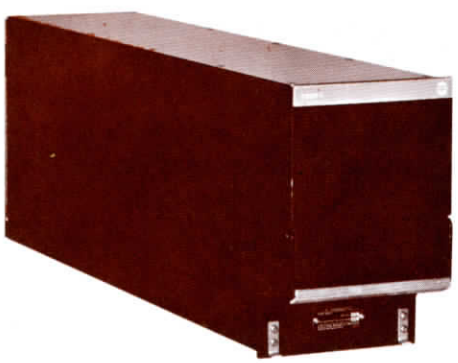
The 789R-1, 789T-1 or 789X-1 IF Translator is used with a 618Z-4 RF Translator to provide either an HF receiver, transmitter or transceiver. The IF translators are part of the Collins Universal Radio Group, a family of integrated HF building block equipment which offers a choice of units to meet a particular communication requirement.

The signal processing circuits of the conventional receiver, exciter and transceiver have been divided into two separate translator units. The IF translator contains the audio and intermediate frequency circuits and uses plug-in circuit cards to permit selection of specific performance capabilities, while the radio frequency circuits are located in the associated 618Z-4 RF Translator using shielded module construction. Power requirements are also supplied from the RF translator. The Collins 310V-1 Exciter, 651F-1 Receiver and 671B-1 Receiver-Exciter typify IF translator applications.

OUTSTANDING PERFORMANCE

Each of the IF translators can be tuned in 100 cycle increments from 500.0 to 500.9 kc. Frequency selection is remotely controlled by applying two grounds on a two-out-of-five wire control system, binary two-out-of-five code. A frequency selection memory circuit can be added for dial-operated remote systems which share frequency control facilities with other system equipments.

Plug-in crystal lattice filters are used for channel separation. The card cage chassis permits any desired degree of implementation which can be easily altered to meet changing communication requirements without chassis modification or long down-time. Transistor circuits are used throughout and each plug-in card contains a complete circuit division.



789R-1

The 789R-1 translates the IF signal from an associated Collins 618Z-4 RF Translator to audio frequencies in receiver applications. It can be optionally implemented to accommodate up to four 3 kc SSB multiplex channels. Each receive channel can be operated individually with unused channels contributing no noise or residual AGC. Channels are enabled by a ground-on line control. When more than one channel is used, the correct individual channel level is automatically established. Each channel line amplifier provides test level samples for isolation of malfunctioning units by means of dc levels. AFC is also available for installations which require compatible operation with signals of low frequency stability. One of the IF channels can be used for a separate AM channel. Diversity combining can be used on any of the channels if required. Each channel has individual AGC rise time constant selection. Injection frequencies are referenced to the 100 kc oscillator in the 618Z-4 or an optional external standard. In systems using 0.1 kc spacing, the RF oscillator frequency selector is controlled by a memory matrix module which retains frequency selection information in the absence of external control.

BASIC CONFIGURATION

The 789R-1 is normally supplied for upper sideband, 3 kc bandwidth and 1 kc RF channel increments.

OPTIONAL CONFIGURATIONS

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

Line Amplifier Options Plug-in audio line amplifiers can be used if a higher channel output level is needed. Both single and dual amplifier card modules are available. Audio levels can be adjusted individually.

Tenth KC Channel Increment Option The number of RF channels can be increased to 280,000.

Memory Matrix Option The memory matrix is necessary only in systems sharing frequency control equipments. 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.

External Frequency Standard Option This option offers greater frequency stability for data communication or other applications. The 789R-1 normally uses the frequency standard in the associated 618Z-4 RF Translator.

789R-1 Specifications

TYPES OF RECEPTION: USB, LSB, 4-channel SSB multiplex, AM or AFC of the sideband channels.

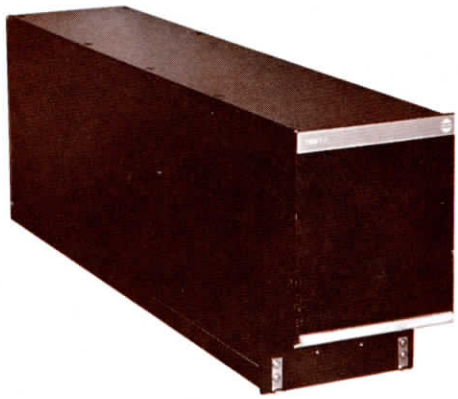
IF INPUT: 5 microvolts to 100 millivolts, 50 ohms.

AF OUTPUT: −10 dbm nominal, 600 ohms (for single tone input above AGC threshold); +10 dbm output optional, depending on module choice.

PRIMARY POWER INPUT: Derived entirely from associated 618Z-4 RF Translator.

SIZE: ½ ATR; 4 7/8" W, 7⅝" H, 19 9/16" D (12.4 cm W, 19.4 cm H, 49.7 cm D).

WEIGHT: 12 lbs. (5.4 kg) minimum implementation; 18 lbs. (8.2 kg) fully implemented.



789T-1

The 789T-1 converts audio inputs to the nominal 500 kc IF signal required by an associated Collins 618Z-4 RF Translator in transmitter applications. It can be optionally implemented to accommodate up to four 3 kc SSB multiplex channels. Channels are enabled by a ground-on line control. When more than one channel is used, the correct individual channel level is automatically established. Each channel provides test level samples for isolation of malfunctioning units by means of dc levels. A pilot carrier is available for installations which require compatible AM operation (AME) or AFC operation.

The transmit gain control and exciter output levels are automatically adjusted. The signal is translated to the nominal 500 kc IF, using injection frequencies stepped in 0.1 kc channel increments when 280,000 channels are used.

BASIC CONFIGURATION

The 789T-1 is normally supplied for upper sideband, 3 kc bandwidth and 1 kc RF channel increments.

OPTIONAL CONFIGURATIONS

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

Tenth KC Channel Increment Option The number of RF channels can be increased to 280,000.

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

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 equipment.

External Standard Option This option offers greater frequency stability for data communication or other applications. The 789T-1 normally uses the frequency standard in the associated 618Z-4 RF Translator.

789T-1 Specifications

EMISSION: USB, LSB, selectable-level carrier plus USB, LSB or both, compatible AM (USB or LSB plus carrier), 4-channel SSB multiplex with outboard channels inverted, CW telegraphy, audio tone data.

AUDIO INPUT: Single test tone —26 dbm nominal; voice —34 VU nominal, 600 ohms, with line amplifiers.

IF OUTPUT: 20 peak millivolts maximum, 50 ohms.

PRIMARY POWER INPUT: Derived entirely from associated 618Z-4 RF Translator.

SIZE: ½ ATR; 4 7/8" W, 7⅝" H, 19 9/16" D (12.4 cm W, 19.4 cm H, 49.7 cm D).

WEIGHT: 11 lbs. (4.99 kg) minimum implementation; 18 lbs. (8.2 kg) fully implemented.

789X-1

The 789X-1 is a bilateral IF translator used in conjunction with a Collins 618Z-4 RF Translator for transceiver applications. Performance characteristics include 100 cycle channel increments with nominal 3 kc or 6 kc bandwidths of two SSB channels or AM. Injection frequencies are referenced to the 100 kc oscillator in the 618Z-4 or an optional external standard. The RF oscillator frequency selector is controlled by a memory matrix module which retains frequency selection information in the absence of external control. In transmit function, the transmit gain control and exciter output levels are automatically adjusted. Pilot carrier is available for installations which require compatible AM operation.

BASIC CONFIGURATION

The 789X-1 is normally supplied for upper sideband, 3 kc

bandwidth and 1 kc RF channel increments, with adjustable pilot carrier reinsertion for compatible AM in transmit.

OPTIONAL CONFIGURATIONS

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

Tenth KC Channel Increment Option The number of RF channels can be increased to 280,000.

Line Amplifier Options Plug-in audio line amplifiers can be used on the incoming line in transmit and the audio output in receive if higher levels are needed. Single input or output line amplifiers for one-channel systems, as well as dual amplifiers for systems using channels on both USB or LSB are available.

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 equipment.

External Frequency Standard Option This option offers extremely high frequency stability for data communication or other applications. The 789X-1 normally uses the frequency standard located in the associated 618Z-4 RF Translator.

789X-1 Specifications

MODES: USB with suppressed carrier, LSB with suppressed carrier, selectable-level carrier plus USB, LSB or both, compatible AM (USB or LSB plus carrier), CW, audio tone data.

AUDIO INPUT (TRANSMIT): Single test tone —26 dbm nominal; voice —34 VU nominal at 600 ohms, with line amplifiers.

IF OUTPUT (TRANSMIT): 20 peak millivolts maximum, 50 ohm impedance.

IF INPUT (RECEIVE): 5 microvolts to 100 millivolts, 50 ohms.

AUDIO OUTPUT (RECEIVE): —10 to +10 dbm nominal into 600 ohms (for single tone input above AGC threshold), with line amplifiers.

PRIMARY POWER INPUT: Derived from associated 618Z-4.

SIZE: ½ ATR; 4 7/8″ W, 7⅝″ H, 19 9/16″ D (12.4 cm W, 19.4 cm H, 49.7 cm D).

WEIGHT: 12 lbs. (5.4 kg) minimum implementation; 25 lbs. (11.3 kg) fully implemented.

Related Equipment

618Z-4 RF Translator, p. 87
714Y-1,-2 Controls, p. 90
Racks and Cabinets, p. 91

714Y-1 Control Unit

The 714Y-1 is a panel or console mounted control unit which permits selection of frequency, operating mode and RF gain level for a Collins Universal Radio Group receiver, exciter or exciter-receiver installation. Channel frequencies are indicated in a direct reading digital readout and can be selected in 1 kc increments throughout the 2.0-29.999 mc range. All frequency selection terminations are diode isolated to permit paralleling of control units.

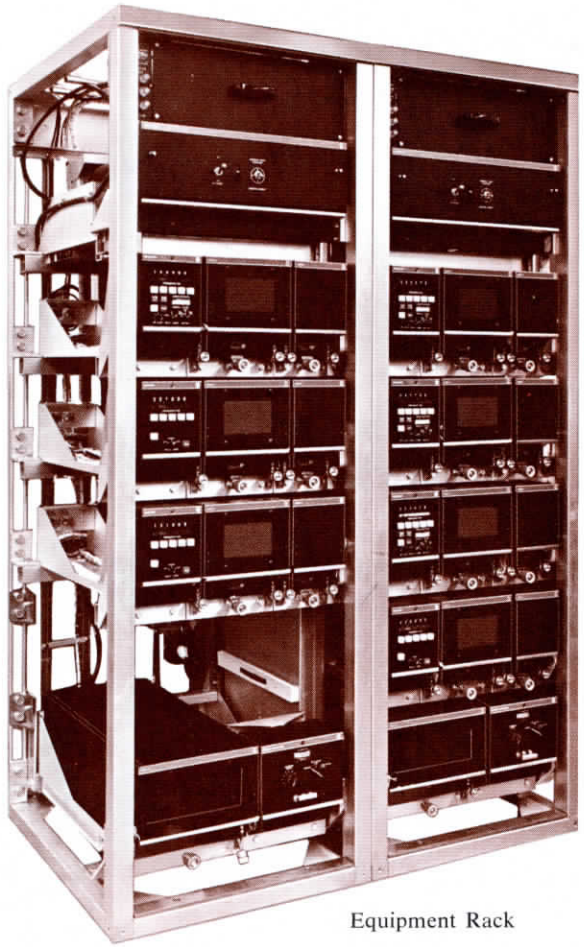
Size: 5¾″ W, 2⅝″ H, 6″ D (14.61 cm W, 6.67 cm H, 15.24 cm D). *Weight:* 2 lbs. (0.91 kg).

714Y-2 Control Unit

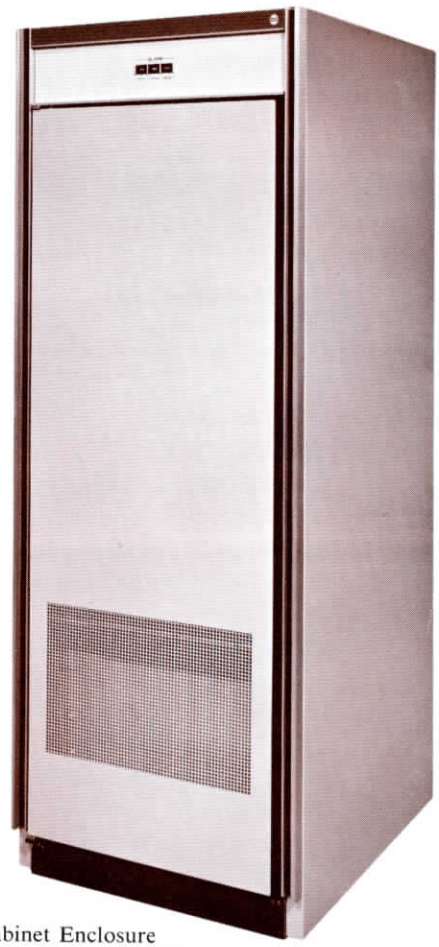
The 714Y-2 is a compact control unit for use with the Collins Universal Radio Group exciters, receivers or exciter-receivers. It allows remote selection of any of 280,000 channels with 0.1 kc spacing over the 2.0-29.9999 mc frequency range. Thumb-index type knobs provide direct digital readout of the operating frequency. All frequency selection terminations are diode isolated for 200 ma current to allow paralleling of control units.

Size: 5¾″ W, 2 9/16″ H, 6 9/32″ D (14.61 cm W, 6.51 cm H, 15.95 cm D). *Weight:* 1 lb. (0.45 kg).

universal radio group Racks and Cabinets



Equipment Rack



Cabinet Enclosure

Features	Applications
Functional Enclosures	*Fixed Station*
ARINC Mounting	*Transportable*
Unified Appearance	*Shipboard*
Flexible Arrangement	*Airborne*

The Universal Radio Group racks and cabinets can be used to house receivers, exciters, receiver-exciters and control equipment in communication systems of varying degrees of complexity for a wide range of applications. The interior rack structure is fabricated of high strength aluminum channels and special hardware which can be easily erected with simple tools. Individual shelves can be located at any desired height. A wide variety of equipment installations can be accommodated by the flexible rack arrangements.

The racks can be enclosed by optional trim panels and flush mounted doors. The exterior finish is light gray enamel, and styling of the cabinet is identical with the Universal Radio Group power amplifier cabinets.

BASIC STRUCTURE

The interior rack consists of four vertical corner posts to which are attached horizontal members supporting the equipment mounting shelves. The most commonly used cabinet is 69″ high over-all; 22″ wide and 27¾″ deep. Other sizes are available for special installations. The rack depth accommodates ARINC Specification 404 long ATR (Air Transport Radio) units. Racks can be used with or without enclosure panels, as required by the type of installation. The racks are designed for solid mounting in all types of service except airborne. The individual shelves can be shockmounted for airborne applications.

COOLING

The system cooling air is supplied by a central blower located in the rack. Air distribution between racks in multiple rack installation is handled by external ducting.

WIRING

A distribution frame on each shelf interconnects power and control units within a system. It has high terminal density and is wired according to standard telephone practices. A rack distribution frame is provided at the top of the rack, accessible from the front, for all external wiring to the rack.