TEMCO SERIES RA

RADIO TRANSMITTER

with exclusive

TEMCO Basic Chassis Unit Construction

TRANSMITTER EQUIPMENT MFG. CO., INC.
345 HUDSON STREET • NEW YORK 14, N. Y.
The new Temco series RA TRANSMITTERS are the answer to your every requirement

Great versatility and revolutionary mechanical innovations in 16 different type transmitters made possible by unique Temco Basic Chassis Unit construction

HOW MANY TRANSMITTERS have you seen or read about in advertisements that have really embodied a new idea ... a basic departure from conventional design? And have you ever before heard of a transmitter that was purposely engineered to enable you to keep it up-to-date with every new development in communication engineering without having to discard it and buy an entirely new one?

Up to now no manufacturer has ever produced all the different type transmitters which your dealer would have to stock in order to fill the great range of communication requirements. Because of production problems and costs, the manufacturer has had to limit his output to a few basic types. Likewise, your dealer, for reasons of good merchandising has faced comparable problems. Hence, in choosing equipment Amateurs were compelled to buy from a limited selection, frequently paying for features that were of no interest to them. Others whose budgets did not permit this luxury had to build their own.

The science of communication engineering moves rapidly ahead. Today's transmitters, already the products of advanced engineering concepts, may soon become obsolete as further major improvements are developed. To the progressive minded Amateur who always wants to keep abreast of such improvements, the factor of equipment obsolescence is costly for it involves expensive alterations and sometimes requires discarding entire equipment when old units cannot be converted or modified satisfactorily or economically.

Spurred by the desire to build Temco Transmitters that would fill every Amateur requirement at prices within easy reach of all, and completely eliminate the obsolescence factor, we enlisted our wartime experience with sectionalized units and plug-in construction to solve these long standing problems. By sectionalizing a transmitter circuit into basic functions, then engineering them into individual plug-in units and combining them into a cabinet of standard internal design WE HAVE FINALLY SUCCEEDED!

From 14 different Temco RA Chassis Units your dealer now provides you with a selection of 16 different type transmitters to fill your every Amateur requirement. (See page 4.)

Now, for the first time in the history of Amateur Radio you can start with a 150 Watt CW unit and later, if you wish, increase power, add NBFM or AM Phone or a VHF unit and be assured of obtaining all the necessary units from one manufacturer who has designed them to operate in unison as a highly efficient and completely integrated transmitter. Furthermore, with each new development in radio communication Temco will produce additional chassis units to enable you to bring your Temco RA Transmitter up-to-date at all times with a minimum investment.

Your equipment will never grow obsolete and your investment in a Temco will be protected forever.

Each Temco Basic Chassis Unit is described in detail in a special illustrated bulletin containing complete specifications, block diagrams and curves. Consult the list on page 4 to select the RA units in which you are interested, then ask your dealer for these special bulletins by model number.

Both Cabinet and Chassis Units are designed and constructed to Temco's high standards of craftsmanship which distinguishes Temco Communication Equipment the world over. Chassis Units are finished in metallized enamel with handsome hammer tone metal etched panels. The Cabinet which has been styled by the foremost Radio Equipment Designer in the country is a masterpiece of simple beauty. Photographs are insufficient to do justice to the Temco RA Series. You've got to see them to appreciate their unsurpassed overall excellence.

All Temco Basic Chassis Units can be purchased individually or in combination as required. They can be employed to augment your present equipment or purchased as a combination together with a cabinet to form a complete transmitter of your choice. Streamlined cabinets, universally pre-wired for all combinations in 150 and 250 watt input ratings, are available as separate units in addition to these chassis.
TEMCO brings you REVOLUTIONARY FLEXIBILITY plus MECHANICAL EXCELLENCE plus ELECTRICAL EFFICIENCY plus SUPERB MODERN STYLING—a combination of features which makes the RA TRANSMITTER the first and only choice for your station.
THE 14 BASIC TEMCO CHASSIS UNITS

R. F. UNITS

MODEL RA-400
Frequency Meter Type Variable Frequency and Crystal Controlled Oscillator Unit Complete with Regulated Power Supply.

MODEL RA-410
Pierce Crystal Oscillator Unit.

MODEL RA-500
Crystal Oscillator and Buffer Doubler Unit with Front of Panel Plug-In Coil Assembly, and One Coil Assembly For Any Band.

MODEL RA-600
Power Amplifier Stage and Wide Band Frequency Multipliers. 150 Watts Input, Using Eimac 4-65A Tube as P.A.*

MODEL RA-610
Power Amplifier Stage and Wide Band Frequency Multipliers. 250 Watts Input, Using RCA 828 Tube as P.A.*

MODEL RA-611
250 Watt Input Final Amplifier Stage, similar to Model RA-610, But Without Wide Band Multipliers. With Coil For Any One Band.

MODEL RA-611A
28 Megacycle Plug-in Frequency Doubler Stage Required Only With Model RA-611 when Model RA-300 NBFM Unit Is Used.

*When the RA-600 or RA-610 is used, plug-in tuning units are required for the Wide Band and Power Amplifier Stages. Both of the aforementioned chassis are furnished with the 80 meter Wide Band Tuning Unit and one Power Amplifier coil for any one of the six amateur bands. Additional wide band and power amplifier plug-in tuning units can be supplied. The requirements for each amateur band are as follows:

<table>
<thead>
<tr>
<th>Meter Band</th>
<th>Wide Band Plug-In Tuning Unit</th>
<th>Power Amplifier Plug-In Tuning Unit</th>
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<tr>
<td>80</td>
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<td>10/11</td>
<td>80,40,20,10/11</td>
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</tbody>
</table>

MODULATOR UNITS

MODEL RA-200
Speech Amplifier-Modulator for AM phone operation, for use with RA-600 Amplifier Unit.

MODEL RA-210
Speech Amplifier-Modulator for AM Phone operation, for use with RA-610 and/or RA-611 Amplifier Unit.

MODEL RA-300
Narrow Band Frequency Modulation Unit, employing phase modulation of direct crystal controlled oscillator with built-in frequency deviation meter.

POWER SUPPLIES

MODEL RA-100
Audio Power Supply for use with RA-200 AM Modulator Unit.

MODEL RA-110
Audio Power Supply for use with the RA-210 AM Modulator Unit.

MODEL RA-120
Dual Low Voltage—High Voltage Power Supply, for use with RA-600 RF Unit.

MODEL RA-121
Dual Low Voltage — High Voltage Power Supply, for use with RA-610 and RA-611 RF Units.

CABINET

MODEL RA-150
Deluxe six section cabinet with hinged front door, three meters, two pilot lights, built-in channelling for automatic insertion of chassis units, antenna change-over relay and remote control box.

THE 16 TRANSMITTER COMBINATIONS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>POWER INPUT (in Watts)</th>
<th>DESCRIPTION (See Below)</th>
<th>R. F. UNITS</th>
<th>MODULATOR UNITS</th>
<th>POWER SUPPLIES</th>
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<tr>
<td>CW Telegraph</td>
<td>150</td>
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<td>RA-410, RA-600</td>
<td>RA-120</td>
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<td>RA-121</td>
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<td>RA-400, RA-610</td>
<td>RA-210</td>
<td>RA-110, RA-121</td>
</tr>
</tbody>
</table>

1 - Crystal Controlled Oscillator with front panel inserted coils for Exciter and Power amplifier stages.
2 - Untuned Pierce Crystal Oscillator with band switching Wide Band Frequency Multipliers and Power Amplifier with single front panel plug-in coil.
3 - Variable Frequency and Crystal Controlled Oscillator driving plug-in coil Exciter unit and Power Amplifier.
4 - Variable Frequency and Crystal Controlled Oscillator with band switching Wide Band Frequency Multipliers and Power Amplifier with single front panel plug-in coil.
THE TEMCO RA-400 Variable Frequency and Crystal Controlled Oscillator is an entirely new and extremely accurate and stable unit that provides frequency control quite similar to that obtained from the Type BC-221 Frequency Meter. Unusual mechanical design was necessary to achieve absolute rigidity so that heretofore unknown frequency stability could be permanently obtained. All frequency determining elements are mounted on and within a heavy cast aluminum subchassis which further provides double shielding of all critical circuits. Thus any possibility of RF pickup from the higher power stages is eliminated, a condition which would adversely affect stability under keying conditions.

Frequency stability of this VFO is better than the average quartz crystal used by amateurs. Its overall stability is better than .01%. Its resettability on 80 meters is better than 100 cycles, due to extremely wide dial coverage (approximately 5000 dial divisions). Thirty turns of the dial are required to cover the frequency range of 3.3 to 4.2 megacycles. As an added convenience, there is provision for the use of two crystals if instantaneous spot frequency operation is desired at any time. Changing from VFO to crystal is instantly accomplished by a front panel control switch.

We have found that if frequency tolerances of the mentioned order are to be maintained, complete isolation of the oscillator stage must be achieved. To accomplish this, we have designed this unit to include the necessary isolation and wide band frequency doubling stages in combination with a well regulated independent power supply. We do not believe that the average amateur possesses the expensive measuring equipment or engineering experience necessary to determine when the proper isolation of the VFO is obtained, particularly when using home constructed buffers or power supplies of questionable regulation. Therefore, the RA-400 is only available as a completely co-ordinated and factory tested and calibrated unit, for only in this form, can we guarantee dependable performance and complete customer satisfaction.

Although employing time proven circuits and principles, this unit differs in many important respects from commonly used electron coupled oscillators.
A double spaced, rigidly constructed tuning condenser with non-backlash gearing is mounted directly on the casting and provides extremely low capacity variation with temperature changes. Both permeability tuning and an adjustable air padder are used for band setting so that proper frequency coverage can be set to match the typical calibration curve. A capacity divider across the oscillator tank minimizes effect of variations in tube capacity on output frequency. Besides electron coupling, a pentode isolation stage assures that load impedance variations will not be reflected to the oscillator. Furthermore, it permits very light oscillator loading. The oscillator operates in the fundamental frequency range of 1650 KC to 2100 KC. The output of the 6SJ7 buffer drives a 6AG7 wide band frequency doubler.

Keying is accomplished by blocking the grid of the oscillator. Oscilloscope examination of the keying wave shows no transients, chirps, thumps or "tails" and frequency is so stable during keying, that no variation can be detected audibly, even on the 16th harmonic. Connections for keying the oscillator are isolated by a built-in RC filter against radio frequency pickup external to the oscillator chassis. Regulated voltage is supplied to the oscillator plate and screen, buffer plate and screen and doubler screen, by means of a self-contained supply.

The RA-400 has been constructed to fit into standard TEMCO Series RA wired cabinets and plug wiring is such, that proper supply voltages, remote switching and RF output coupling are connected automatically when plugging the unit into its cabinet. This unit is recommended for use with the RA-600, RA-610 wide band frequency multipliers-power amplifier chassis, or with RA-500, RA-611 combination. However, the RA-400 may be readily incorporated into existing or contemplated equipments by the simple addition of a Jones Series 2412 socket, which can be supplied by your dealer, or by the factory.

**SPECIFICATIONS**

**RF OUTPUT:** High impedance output of 60 volts r.m.s. is available over the range 3.3 to 4.2 m.c. This range permits operation with suitable multipliers, into any of the amateur bands up to and including the 420-430 m.c. band. Tuning of the output band-pass transformer is normally for 3.39-4.0 m.c. pass-band, suitable for multiplication to all amateur frequencies up to 29.7 m.c.

**STABILITY:** Sum of fast drift (temperature drift), slow drift (humidity and voltage) and reset error are insufficient to cause frequency drift of .01%. Temperature compensation is such, as to hold carrier within acceptance band of a 29 m.c. receiver (+ 2 KC), during ambient temperature rise of 10 degrees Centigrade, such as might be encountered in transmitter enclosure during long transmissions.

**DIAL:** The range 3500 to 4200 KC is covered by approximately 3000 total dial divisions. The vernier dial is graduated 100 divisions per revolution and is equipped with a fast running knob. Both vernier and counter dials are full vision.

**POWER INPUT:** 117 volts AC at 1/2 ampere.

**DIMENSIONS:**
- Height: 8¾”
- Width: 6” (not including side wiper for high impedance RF output)
- Length: Chassis 14” (including knobs and connectors 16”.

**FINISH:** TEMCO green-gray hammertone metal etched panel.
WIDE BAND AMPLIFIERS in receiver class A circuits have been commonplace for many years; but so far as we know, this is the first extension of the principle to transmitter class C design. TEMCO has adopted this general approach to minimize controls on separate VFO and IPA/PA plug-in chassis. The basic amplifier consists of a 1614 buffer amplifier, three 1614 doublers and a 4-65A power amplifier, coupled to each other by double tuned circuits. The first stage is over-coupled (3.39-4.0 mcs), the next two, (7 and 14 mcs), critically coupled and the last (27.16-29.7 mcs) is over-coupled to the power amplifier.

As coupled circuits give bandspread percentage-wise, the fact that different stages are on different harmonics of the input makes no difference in relative bandpass. For example, with twice critical coupling and operating Q's of 10, a total bandpass of plus or minus 10% of center frequency can be obtained, whether this center frequency be 3.7 mcs or 28.4 mcs. To prevent the trough response from dropping too low, two of the transformers are coupled less tightly than the other two. The curves Nos. 1 to 4 illustrate the principle.

Two circumstances assist in delivering reasonably uniform drive to the final amplifier over the 27.160 to 29.700 m.c. range. First, class “C” amplifiers tend to saturate or act as limiters so that output does not vary as widely as input. Second, drive required for a 1614 doubler is less than that required for a 4-65A final amplifier, permitting resistors to be switched into the transformer secondaries between doubler stages, reducing secondary Q and reducing possibilities of parasites developing as a result of lead inductances and stray capacities in the switch deck.

This precaution, coupled with small diameter, well shielded coils in all low level stages, assures freedom from parasites and self-oscillation along the string of multipliers—a “must” in any transmitter, but all the more important if successful operation on narrow band frequency modulation is contemplated.

Both the multiplier and final amplifier coils are plug-in, so that economy minded persons not wishing to operate on all bands, may buy only those units which they intend to use. Once plugged in, selection of the bandpass transformers is accomplished by means of a front panel controlled switch. Designed primarily for use in TEMCO pre-wired cabinets, in conjunction with either the RA-400 VFO or RA-300 NBFM, the Model RA-600 can also easily be used in home-built equipment and makes an ideal driver for the high power output stage in the 500 to 1000 watt class.
**SPECIFICATIONS**

**CONTROLS:**
- PA tuning dial
- Antenna loading vernier dial
- Bandswitch
- Facilities for changing PA coil units through front panel

**OUTPUT FREQUENCIES:**
Six bands available in five positions of selector switch, as follows:
- 3.5 to 4.0 mcs
- 7.0 to 7.5 mcs
- 14.0 to 14.4 mcs
- 21.0 to 21.5 mcs
- 27.1 to 29.7 mcs

**OUTPUT COUPLING:**
Balanced or unbalanced, 50-600 ohm lines may be matched on all bands. A panel dial for vernier control of loading is provided.

**BIAS:**
Fixed bias is furnished by self-contained bias supply.

**POWER REQUIREMENTS:**
From external supplies, such as TEMCO RA-120, the following voltages are needed:
- 6.3 volts at 7.2 amperes
- 380 v.d.c. — 225 milliamperes
- 1100 v.d.c. — 137 milliamperes
- 350 v.d.c. — 40 milliamperes (for PA screen grid)
- 117 v.a.c. — 1/5 ampere (for bias supply)

**RATINGS:**
150 watts input (Phone and CW) on all bands.

**RF INPUT:**
40-100 volts r.m.s. at high impedance through wiper on side of chassis which automatically engages to TEMCO RA-400 VFO or RA-300 NBFM unit output when used in TEMCO Series RA pre-wired cabinet.

**DIMENSIONS:**
- Height: 8 3/4”
- Width: 9” (not including side wiper for high impedance RF input)
- Depth: Chassis 14” (including knobs and connectors 16”)

**FINISH:**
TEMCO green-gray hammer-tone metal etched panel.
THE RA-200 speech amplifier-modulator unit has been designed to modulate a tetrode or pentode power amplifier at voice frequencies between 200 and 5000 c.p.s., with inputs up to 150 watts. While output is only 50 watts for sinusoidal waveform, the sharp peaks occurring in ordinary voice waveforms are easily supplied by this modulator so that inputs of 150 watts to a final amplifier (rather than 100 watts as might be expected when sine wave modulation is used), can be successfully modulated.

The push-pull parallel 6L6 modulator circuit has been laboratory tested in order to carefully check its operation to highly critical standards. This unit is completely free of self-oscillation at any condition, from no signal to peak signal operation; thus eliminating AF distortion and spurious side bands on output carrier.

The CW man who wants to convert his present telegraph transmitter for phone operation, will find the RA-200 and its associated power supply, RA-100, the most convenient solution to his problem. The RA-200 is recommended for use with RA-600, 150 watt power amplifier and wide band frequency multipliers.
SPECIFICATIONS

INPUT: From low level (—50 dbm) microphone, high impedance. Filtered against RF pickup.

TUBES: 6SJ7, 6J5, 4-6L6s.

OUTPUT POWER: 50 watts at 400 c.p.s., sinusoidal waveform. Sufficient to modulate 150 watts input 100% with complex (voice) waveforms.

OUTPUT IMPEDANCE: 8000 ohms. A 20,000 ohm tertiary winding provides for modulation of pentode or tetrode screen grids.

SWITCHING: A ceramic switch provides for shorting out both output transformer secondaries when changing to CW operation.

FREQUENCY RESPONSE: ± 2 db from 200 to 5000 c.p.s.

DISTORTION: Below 6% for full output from 300 to 4000 c.p.s.

INPUT POWER REQUIREMENT:
- 6.3 v.a.c. at 4.2 amperes
- 250 v.d.c. at 2 milliamperes
- 300 v.d.c. at 30 milliamperes
- 360 v.d.c. at 200/300 milliamperes

INPUT VOLTAGE: 117 volts, 50/60 cycles

DIMENSIONS:
- Height: 8⅞"
- Width: 6"
- Length: Chassis 14” (including knob and connector, 16”.)

FINISH: TEMCO green-gray hammertone metal etched panel
DESCRIPTION

Wide band amplifiers in receiver class A circuits have been commonplace for many years; but so far as we know, this is the first extension of the principle to transmitter class C design. TEMCO has adopted this general approach to minimize controls on separate VFO and IPA/PA plug-in chassis. The basic amplifier consists of a 1614 buffer amplifier, three 1614 doublers and a 4-65A power amplifier, coupled to each other by double tuned circuits. The first stage is over-coupled (3.39-4.0 mcs), the next two, (7 and 14 mcs), critically coupled and the last (27.16-29.7 mcs) is over-coupled to the power amplifier.

As coupled circuits give bandspread percentage-wise, the fact that different stages are on different harmonics of the input makes no difference in relative bandpass. For example, with twice critical coupling and operating Q's of 10, a total bandpass of plus or minus 10% of center frequency can be obtained, whether this center frequency be 3.7 mcs or 28.4 mcs. To prevent the trough response from dropping too low, two of the transformers are coupled less tightly than the other two. The curves Nos. 1 to 4 illustrate the principle.

This precaution, coupled with small diameter, well shielded coils in all low level stages, assures freedom from parasitics and self-oscillation along the string of multipliers—a "must" in any transmitter, but all the more important if successful operation on narrow band frequency modulation is contemplated.

Both the multiplier and final amplifier coils are plug-in, so that economy minded persons not wishing to operate on all bands, may buy only those units which they intend to use. Once plugged in, selection of the bandpass transformers is accomplished by means of a front panel controlled switch.

Designed primarily for use in TEMCO pre-wired cabinets, in conjunction with either the RA-400 VFO or RA-300 NBFM, the Model RA-600 can also easily be used in home-built equipment and makes an ideal driver for the high power output stage in the 500 to 1000 watt class.
INPUT
40-100 V.R.M.S.
3.39-40 MCS

1614 BUFFER AMP
3.39-4.0 MG
BAND-PASS TRANS
1614 DOUBLER
6.8-7.5 MG
BAND-PASS TRANS
1614 DOUBLER TRIPLER
13.8-15.0 MG
BAND-PASS TRANS
1614 DOUBLER
27.16-29.7 MG
BAND-PASS TRANS
4-65A PA

6X5GT PCT.
BIAS TRANS

SPECIFICATIONS

CONTROLS:
PA tuning dial
Antenna loading vernier dial
Bandswitch
Facilities for changing PA coil units through front panel

OUTPUT FREQUENCIES:
Six bands available in five positions of selector switch, as follows:
3.5 to 4.0 mcs
7.0 to 7.3 mcs
14.0 to 14.4 mcs
21.0 to 21.5 mcs
27.1 to 29.7 mcs

OUTPUT COUPLING:
Balanced or unbalanced, 50-600 ohm lines may be matched on all bands. A panel dial for vernier control of loading is provided.

BIAS:
Fixed bias is furnished by self-contained bias supply.

POWER REQUIREMENTS:
From external supplies, such as TEMCO RA-120, the following voltages are needed:
6.3 volts at 7.2 amperes
380 v.d.c.—225 milliamperes
1100 v.d.c. — 137 milliampere
350 v.d.c. — 40 milliampere
(for PA screen grid)
117 v.a.c. — 1/5 amperes (for bias supply)

RATINGS:
150 watts input (Phone and CW) on all bands.

DIMENSIONS:
Height: 8½”
Width: 9” (not including side wiper for high impedance RF input)
Depth: Chassis 14” (including knobs and connectors 16”)

RF INPUT:
40-100 volts r.m.s. at high impedance through wiper on side of chassis which automatically engages to TEMCO RA-400 VFO or RA-300 NBFM unit output when used in TEMCO Series RA pre-wired cabinet.

FINISH:
TEMCO green-gray hammer-tone metal etched panel.
THE TEMCO RA-400 Variable Frequency and Crystal Controlled Oscillator is an entirely new and extremely accurate and stable unit that provides frequency control quite similar to that obtained from the Type BC-221 Frequency Meter. Unusual mechanical design was necessary to achieve absolute rigidity so that heretofore unknown frequency stability could be permanently obtained. All frequency determining elements are mounted on and within a heavy cast aluminum sub-chassis which further provides double shielding of all critical circuits. Thus any possibility of RF pickup from the higher power stages is eliminated, a condition which would adversely affect stability under keying conditions.

Frequency stability of this VFO is better than the average quartz crystal used by amateurs. Its overall stability is better than .01%. Its resettability on 80 meters is better than 100 cycles, due to extremely wide dial coverage (approximately 3000 dial divisions). Thirty turns of the dial are required to cover the frequency range of 3.3 to 4.2 megacycles. As an added convenience, there is provision for the use of two crystals if instantaneous spot frequency operation is desired at any time. Changing from VFO to crystal is instantly accomplished by a front panel control switch.

We have found that if frequency tolerances of the mentioned order are to be maintained, complete isolation of the oscillator stage must be achieved. To accomplish this, we have designed this unit to include the necessary isolation and wide band frequency doubling stages in combination with a well regulated independent power supply. We do not believe that the average amateur possesses the expensive measuring equipment or engineering experience necessary to determine when the proper isolation of the VFO is obtained, particularly when using home constructed buffers or power supplies of questionable regulation. Therefore, the RA-400 is only available as a completely co-ordinated and factory tested and calibrated unit, for only in this form, can we guarantee dependable performance and complete customer satisfaction.

Although employing time proven circuits and principles, this unit differs in many important respects from commonly used electron coupled oscillators.
A double spaced, rigidly constructed tuning condenser with non-backlash gearing is mounted directly on the casting and provides extremely low capacity variation with temperature changes. Both permeability tuning and an adjustable air padder are used for band setting so that proper frequency coverage can be set to match the typical calibration curve. A capacity divider across the oscillator tank minimizes effect of variations in tube capacity on output frequency. Besides electron coupling, a pentode isolation stage assures that load impedance variations will not be reflected to the oscillator. Furthermore, it permits very light oscillator loading. The oscillator operates in the fundamental frequency range of 1650 KC to 2100 KC. The output of the 6SJ7 buffer drives a 6AG7 wide band frequency doubler.

Keying is accomplished by blocking the grid of the oscillator. Oscilloscope examination of the keying wave shows no transients, chirps, thumps or "tails" and frequency is so stable during keying, that no variation can be detected audibly, even on the 16th harmonic. Connections for keying the oscillator are isolated by a built-in RC filter against radio frequency pickup external to the oscillator chassis. Regulated voltage is supplied to the oscillator plate and screen, buffer plate and screen and doubler screen, by means of a self-contained supply.

The RA-400 has been constructed to fit into standard TEMCO Series RA wired cabinets and plug wiring is such, that proper supply voltages, remote switching and RF output coupling are connected automatically when plugging the unit into its cabinet. This unit is recommended for use with the RA-600, RA-610 wide band frequency multipliers-power amplifier chassis, or with RA-500, RA-611 combination. However, the RA-400 may be readily incorporated into existing or contemplated equipments by the simple addition of a Jones Series 2412 socket, which can be supplied by your dealer, or by the factory.

**SPECIFICATIONS**

**RF OUTPUT:** High impedance output of 60 volts r.m.s. is available over the range 3.3 to 4.2 m.c. This range permits operation with suitable multipliers, into any of the amateur bands up to and including the 420-430 m.c. band. Tuning of the output band-pass transformer is normally for the pass-band, suitable for multiplication to all amateur frequencies up to 29.7 m.c.

**STABILITY:** Sum of fast drift (temperature drift), slow drift (humidity and voltage) and reset error are insufficient to cause frequency drift of .01%. Temperature compensation is such, as to hold carrier within acceptance band of a 29 m.c. receiver (+ 2 KC), during ambient temperature rise of 10 degrees Centigrade, such as might be encountered in transmitter enclosure during long transmissions.

**DIAL:** The range 3500 to 4200 KC is covered by approximately 3000 total dial divisions. The vernier dial is graduated 100 divisions per revolution and is equipped with a fast running knob. Both vernier and counter dials are full vision.

**POWER INPUT:** 117 volts AC at 1/2 ampere.

**DIMENSIONS:** Height: 8 3/8" Width: 6" (not including side wiper for high impedance RF output) Length: Chassis 14" (including knobs and connectors 16".

**FINISH:** TEMCO green-gray hammertone metal etched panel.
TRANSMITTER EQUIPMENT MFG. CO., INC.
New York, New York

TELECO Series "RA" Price Schedule

R.F. UNITS

Model RA-400 - Frequency Meter Type Variable Frequency and Crystal Controlled Oscillator Unit, complete with tubes and regulated power supply $99.50

Model RA-410 - Pierce Crystal Oscillator Unit complete with tube 35.00

Model RA-500 - Crystal Oscillator and Buffer Doubler Unit with front panel plug-in coil assembly furnished with one coil assembly for any band and set of tubes 95.00

Model RA-600 - 150 Watt Input Wide Band Frequency Multiplier and Power Amplifier Stage using Eimac 4-65A tube as P.A. complete with 80 meter Wide Band coil and P.A. coil for any band and set of tubes ** (See Footnote) 154.50

Model RA-610 - 250 Watt Input Wide Band Frequency Multiplier and Power Amplifier Stage using RCA 828 tube as P.A., complete with 80 meter Wide Band coil and P.A. coil for any band and set of tubes ** (See Footnote) 199.50

Model RA-611 - 250 Watt Input Final Amplifier Stage, similar to Model RA-610 but without Wide Band Amplifiers, complete with RCA 828 tube and coil for any one band 90.00

Model RA-611A - 28 Megacycle Plug-in Frequency Doubler Stage required only with Model RA-611 when Model RA-500 NBFM unit is used 18.00

** When the RA-600 or RA-610 is used, plug-in tuning units are required for the Wide Band and Power Amplifier Stages. Both of the aforementioned chassises are furnished with the 80 meter Wide Band Tuning Unit and one Power Amplifier coil for any one of the six amateur bands. Additional Wide Band and Power Amplifier plug-in tuning units can be supplied at $5.00 and $15.00 respectively. The requirements for each amateur band and the additional cost, is as follows:

<table>
<thead>
<tr>
<th>Meter Band</th>
<th>Wide Band Plug-in Unit</th>
<th>Power Amplifier Plug-in Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>80</td>
<td>80</td>
<td>n/c</td>
</tr>
<tr>
<td>40</td>
<td>40, 40</td>
<td>40</td>
<td>$9.00</td>
</tr>
<tr>
<td>20</td>
<td>80, 40, 20</td>
<td>20</td>
<td>18.00</td>
</tr>
<tr>
<td>15</td>
<td>80, 40, 15</td>
<td>15</td>
<td>18.00</td>
</tr>
<tr>
<td>10/11</td>
<td>80, 40, 20, 10/11</td>
<td>10/11</td>
<td>27.00</td>
</tr>
</tbody>
</table>

The above prices are based on the assumption that the amateur desires to operate on only one band specified in the first column. If multi-band operation is desired, $15.00 for each additional band (excluding the first) must be added to the cost as listed in the schedule to cover the additional coils for the Power Amplifier Stage.

** MODULATOR UNITS **

Model RA-200 - Speech Amplifier-Modulator for AM phone operation, for use with RA-600 Amplifier Unit, complete with tubes $60.00

Model RA-210 - Speech Amplifier-Modulator for AM phone operation, for use with RA-610 and/or RA-611 Amplifier Units, complete with tubes 99.50

Model RA-300 - Narrow Band Frequency Modulation Unit, employing phase modulation of direct crystal controlled oscillator with built-in frequency deviation meter, complete with tubes 125.00

** POWER SUPPLIES **

Model RA-100 - Audio Power Supply for use with RA-200 AM Modulator Unit, complete with tubes 49.75

Model RA-110 - Audio Power Supply for use with RA-210 AM Modulator Unit, complete with tubes 79.50

Model RA-120 - Dual Low Voltage-High Voltage Power Supply, for use with Model RA-600 RF Unit, complete with tubes 90.00

Model RA-121 - Dual High Voltage-Low Voltage Power Supply for use with RA-610 RR Unit, complete with tubes 110.00

** CABINET **

Model RA-150 - Deluxe, six section cabinet with hinged front door, three meters, two pilot lights, built-in channelling for automatic insertion of chassis units, antenna change-over relay and remote control box, complete with cabling 150.00

ALL PRICES QUOTED ARE NET, F.O.B. FACTORY
SUBJECT TO CHANGE WITHOUT NOTICE. EXPORT PACKING AND HANDLING EXTRA.

Effective Date - August 1, 1947.
<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>POWER INPUT (In Watts)</th>
<th>R.F. UNITS</th>
<th>MODULATOR UNITS</th>
<th>POWER SUPPLIES</th>
<th>DESCRIPTION (SEE BELOW)</th>
<th><strong>SEE NOTE A PRICE</strong></th>
<th>COMBINATION NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW Telegraph</td>
<td>150</td>
<td>RA-410, RA-600</td>
<td>-</td>
<td>RA-120</td>
<td>2</td>
<td>$429.50</td>
<td>1-C</td>
</tr>
<tr>
<td>CW Telegraph</td>
<td>150</td>
<td>RA-400, RA-600</td>
<td>-</td>
<td>RA-120</td>
<td>4</td>
<td>494.00</td>
<td>2-C</td>
</tr>
<tr>
<td>CW Telegraph</td>
<td>250</td>
<td>RA-500, RA-611</td>
<td>-</td>
<td>RA-121</td>
<td>1</td>
<td>409.50</td>
<td>3-C</td>
</tr>
<tr>
<td>CW Telegraph</td>
<td>250</td>
<td>RA-500, RA-611, RA-400</td>
<td>-</td>
<td>RA-121</td>
<td>3</td>
<td>509.00</td>
<td>4-C</td>
</tr>
<tr>
<td>CW Telegraph</td>
<td>250</td>
<td>RA-410, RA-610</td>
<td>-</td>
<td>RA-121</td>
<td>2</td>
<td>494.50</td>
<td>5-C</td>
</tr>
<tr>
<td>CW Telegraph</td>
<td>250</td>
<td>RA-400, RA-610</td>
<td>-</td>
<td>RA-121</td>
<td>4</td>
<td>559.00</td>
<td>6-C</td>
</tr>
</tbody>
</table>

| Narrow Band FM Phone and CW | 150 | RA-600 | RA-300 | RA-120 | 2 | 519.50 | 1-F |
| Narrow Band FM Phone and CW | 150 | RA-400, RA-600 | RA-300 | RA-120 | 4 | 619.00 | 2-F |
| Narrow Band FM Phone and CW | 250 | RA-500, RA-611, RA-611A | RA-300 | RA-121 | 1 | 552.50 | 3-F |
| Narrow Band FM Phone and CW | 250 | RA-610 | RA-300 | RA-121 | 2 | 584.50 | 4-F |
| Narrow Band FM Phone and CW | 250 | RA-400, RA-610 | RA-300 | RA-121 | 4 | 684.00 | 5-F |

| AM Phone and CW | 150 | RA-410, RA-600 | RA-200 | RA-100, RA-120 | 2 | 539.25 | 1-A |
| AM Phone and CW | 150 | RA-400, RA-600 | RA-200 | RA-100, RA-120 | 4 | 603.75 | 2-A |
| AM Phone and CW | 250 | RA-500, RA-611 | RA-210 | RA-110, RA-121 | 1 | 588.50 | 3-A |
| AM Phone and CW | 250 | RA-410, RA-610 | RA-210 | RA-110, RA-121 | 2 | 673.50 | 4-A |
| AM Phone and CW | 250 | RA-400, RA-610 | RA-210 | RA-110, RA-121 | 4 | 738.00 | 5-A |

1 - Crystal Controlled Oscillator with front of panel inserted coils for Exciter and Power Amplifier Stages.

2 - Untuned Pierce Crystal Oscillator with band switching Wide Band Frequency Multipliers and Power Amplifier with single front of panel plug-in coil.

3 - Variable Frequency and Crystal Controlled Oscillator driving plug-in coil Exciter Unit and Power Amplifier.

4 - Variable Frequency and Crystal Controlled Oscillator with band switching Wide Band Frequency Multiplier and Power amplifier with single front of panel plug-in coil.

NOTE A.
These prices include one set of tubes and one set of coils for any one band for Combinations 3-A, 3-C, 3-F and 4-C. For all other combinations, the price includes the 80 meter Wide Band Multiplier coil and P.A. coil for any chosen band. Extra Wide Band Multiplier coils can be supplied at $9.00 each. Extra Power Amplifier coils can be supplied at $15.00 each.