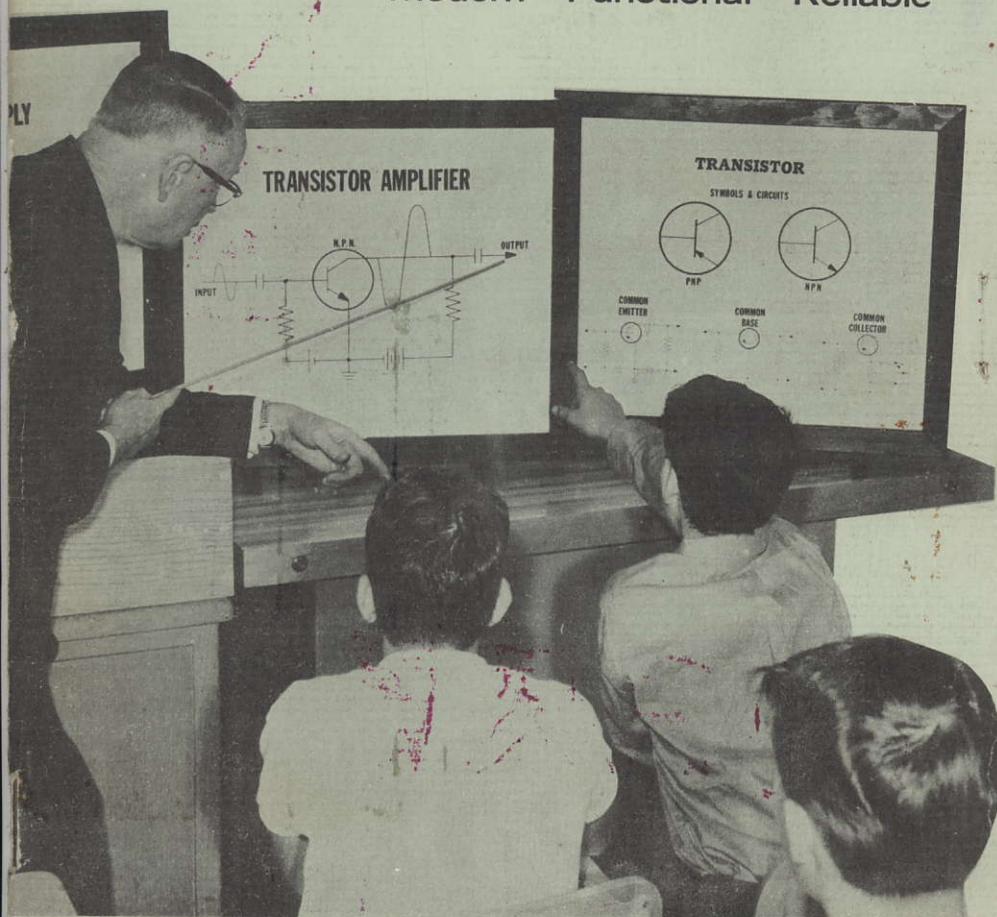


*Graymark,*

# ELECTRONICS

Modern • Functional • Reliable



Teachers are absolutely dependent on fast reliable shipping. In full realization of this GRAYMARK has initiated wholly new methods of shipping. Components, separately and in units, are triple checked. Orders are shipped United Parcel Railroad Express promptly on receipt of your order.

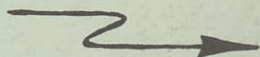
"IT CAN'T BE GOOD AT THAT PRICE!" Please examine the component specifications carefully. Components (and those listed separately are included in our units) are a selected choice of commercial parts, many meeting military specifications as noted.

Selection is discriminative in terms of shop needs. Only items that fill a need in terms of the Electronic shop are included. Our line is constantly expanding. Please make inquiry about special requirements.

Selection is discriminative in terms of function. Microphones, earphones, speakers, trimmer capacitors, etc., are selected from a large variety of available components in terms of maximum performance with GRAYMARK circuits.

Development is continuous. Following introduction of the 506 Short Wave receiver, we began development on a companion C. W. Transmitter. The price on this will follow policy as established on other units.... rock bottom consistent with commercial components. Citizen's band units will be available in the future.

Five of the many SHOP TESTED GRAYMARK CIRCUITS.

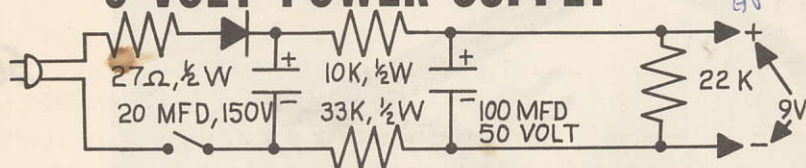


Orders on your school letterhead, please. Our margins make it impossible to meet orders of less than \$5.00.

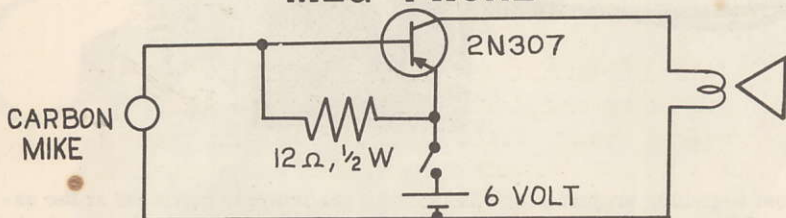


# 9 VOLT POWER SUPPLY

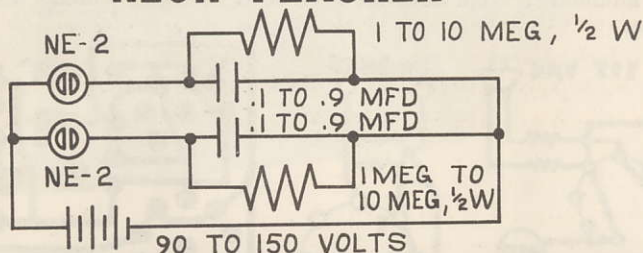
Cost approx. \$6-19



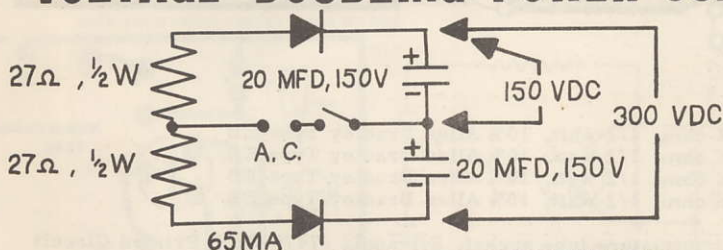
# MEG PHONE



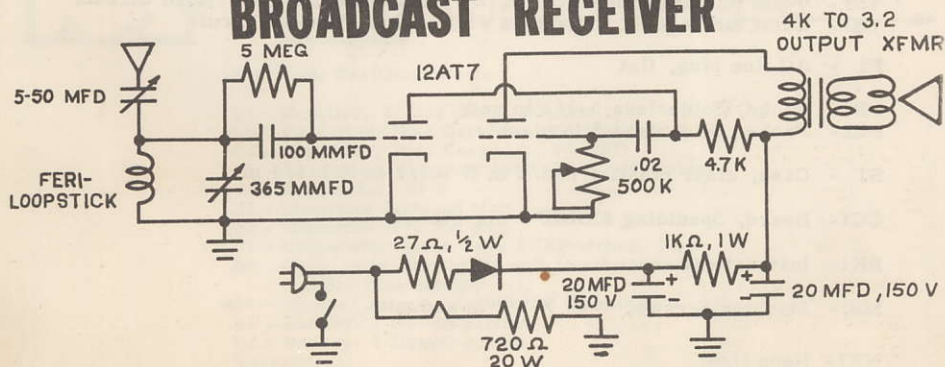
# NEON FLASHER

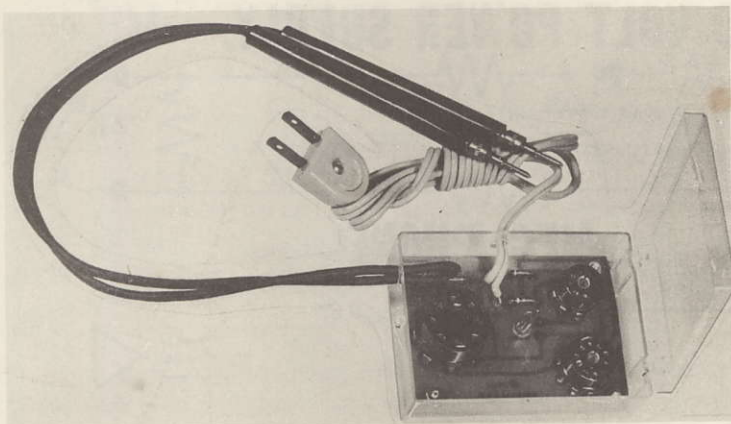


# VOLTAGE DOUBLING POWER SUPPLY



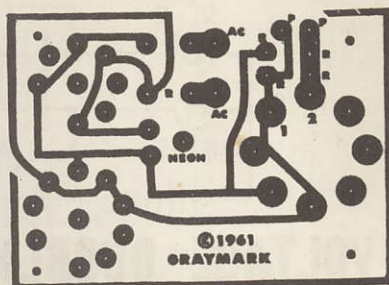
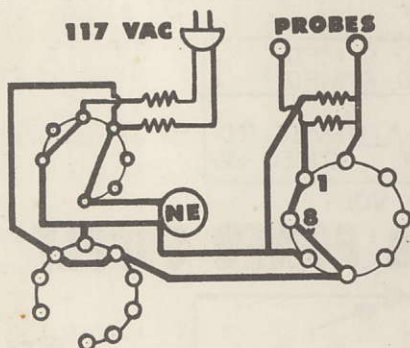
# BROADCAST RECEIVER





A low cost beginning project which has proved particularly practical at the extremes of 7th grade and adult education where an introductory project is desired.

Will check: Continuity with use of probes. Filaments of any vacuum tube using 7-pin miniature, 9-pin miniature, or octal sockets. Voltage with use of probes.



- R1 - 100K ohm, 1/2 watt, 10% Allen Bradley Type EB
- R2 - 100K ohm, 1/2 watt, 10% Allen Bradley Type EB
- R3 - 100K ohm, 1/2 watt, 10% Allen Bradley Type EB
- R4 - 100K ohm, 1/2 watt, 10% Allen Bradley Type EB

- TS1 - 7-pin miniature tube socket, Sylvania #7470-0102 Printed Circuit
- TS2 - 9-pin miniature tube socket, Sylvania #7490-0080 Printed Circuit
- TS3 - Octal tube socket, Sylvania #7480-0106 Printed Circuit

P1 - AC line plug, flat

- PR1- Probe, Solderless 5-1/2 in red
- PR2- Probe, Solderless 5 in black

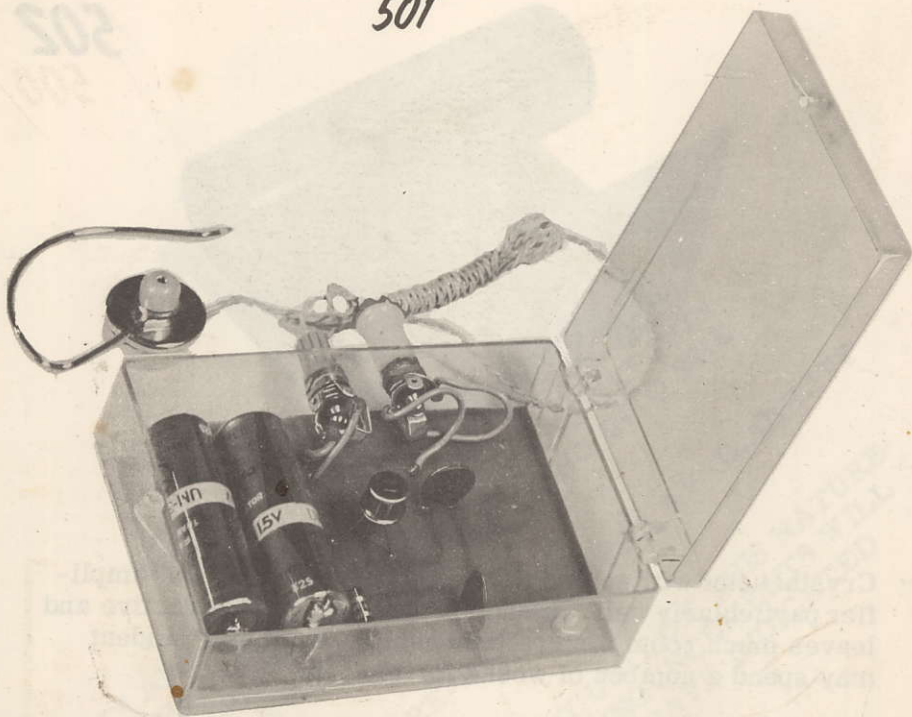
B1 - Case, clear plastic, 2-5/8 in X 3-1/2 in X 1-1/4 in

CC1- Board, Spaulding #XXXP 1 oz, etched

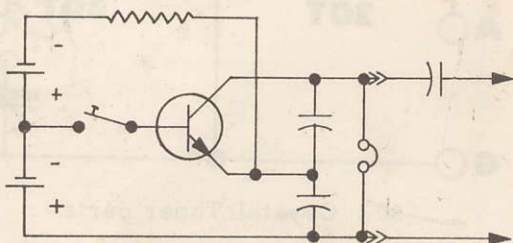
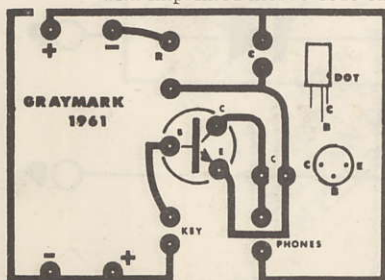
BK1- Instructions

MS1- Machine Screws, 4-40 X 1/2 in and nuts

NE1- Neon light



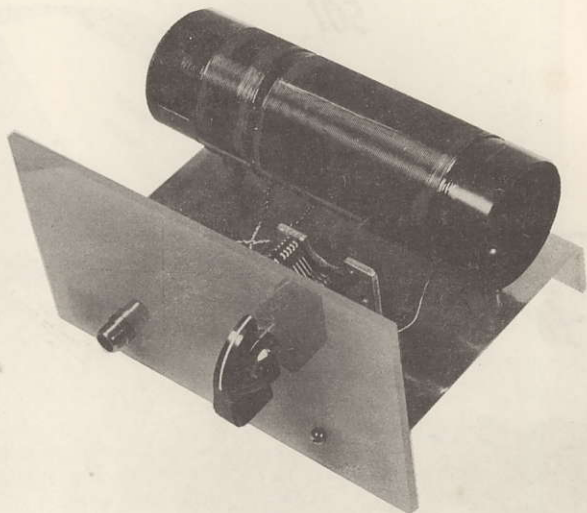
Code Oscillator which is adaptable with the 505 Transmitter or Amplifier or use separately with earphones. Suitable for beginning students or in advanced classes involving study of code. Very attractive case supplied with imprinted morse code on top.



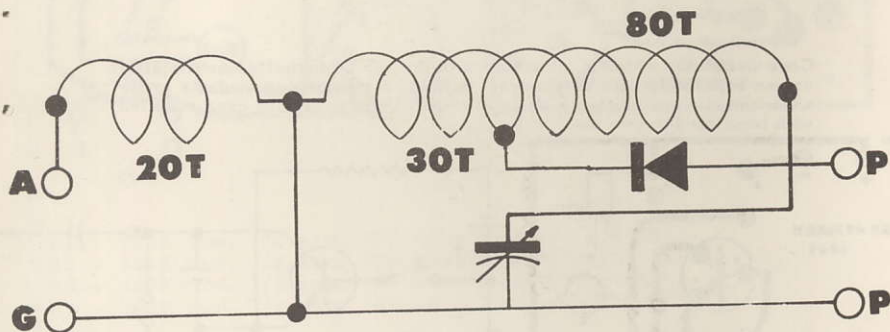
#### 501 Code Oscillator Parts

- R1 - Resistor, 27,000 ohms, 1/2 Watt 10%
  - C1 - Capacitor, Disc Ceramic, .04 MFD
  - C2 - Capacitor, Disc Ceramic, .04 MFD
  - P1 - Earphones, magnetic 5000 ohms, with holder
  - T1 - Transistor, NPN
  - J1 - Miniature Jack and plug
  - J2 - Miniature Jack and plug
  - CCB1 - Copperclad board, type XXXP etched, 1 oz.
  - D1 - Case, clear plastic top with imprinted morse code, Blue bottom.
  - MS1 - Machine screws, 4-40 by 1/2 (4) with nuts
  - B1 - Battery, 1 1/2 volt penlite
  - B2 - Battery, 1 1/2 volt penlite
- Instructions





Crystal tuner with selectivity. Unit couples into "505" amplifier particularly well. A shop project which is attractive and leaves much room for craftsmanship. Beginning student may spend a number of weeks for top job.



502 Crystal Tuner parts

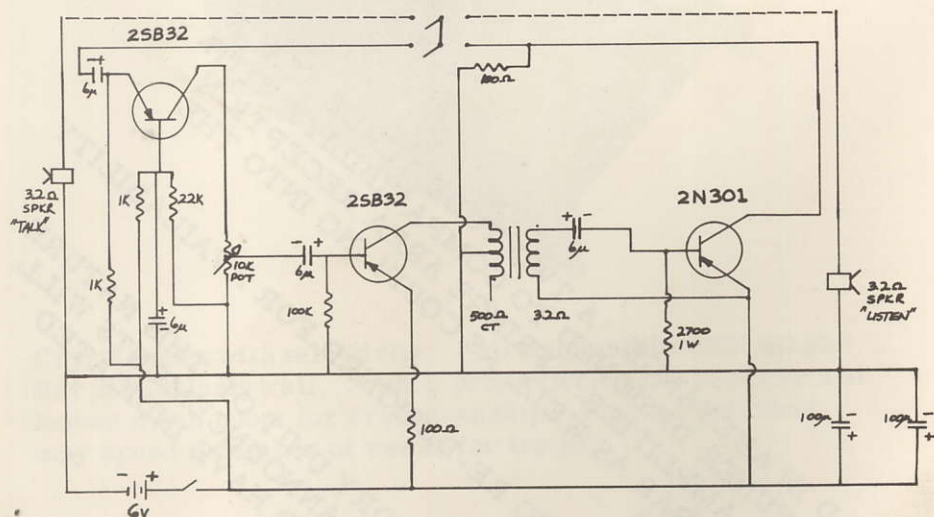
- C1 - Capacitor, dual section variable with vernier
- L1 - Coil form, clear Acetate Butyrate impact resistant 5 in by 1 1/2 in O. D.
- F1 - Front, plexiglass translucent in various colors, 5 1/2 in. by 3 in. by 1/8 in.
- B1 - Base, 24 gauge steel, 5 in. by 5 in.
- J1 - Jack and plug, RCA phone type
- W1 - Washers, insulating #7856 Walsco (2)
- D1 - Diode, similar to 1N43
- H1 - Fahnstock clips (2)
- K1 - Knob, pointer type
- MS1 - Machine screws, 4-40 x 1/2 in (4) with nuts
- MS2 - Machine screws, 4-40 x 1 in (2) with nuts

HELD IN ABEYANCE: A TWO TUBE THREE STAGE  
F.M. TUNER DESIGNED TO COMPATIBILITY WITH  
THE 505 AMPLIFIER. FRINGE AREA RECEPTION  
IS BELOW PAR AS WELL AS COUPLING INTO THE  
505.

THE UNIT IS BEING RE-DESIGNED FOR AVAILABILITY  
IN THE FUTURE.

WE THINK A SATISFACTORY UNIT OF THIS NATURE  
IS WORTH WAITING FOR. ANNOUNCEMENTS WILL  
BE SENT TO ALL THOSE WHO HAVE INDICATED  
INTEREST

## INTERCOM AMPLIFIER



## PARTS LIST FOR THE INTERCOM AMPLIFIER:

1. Printed circuit board
- 1 10 K Potentiometer and switch
- 2 1K 1/2 W Composition Resistor
- 1 22K 1/2W Composition Resistor
- 1 100K 1/2W Composition Resistor
- 2 100 ohm 1/2W Composition Resistor
- 1 2700 ohm 1W composition Resistor
- 4 6 ufd 12V Electrolytic Capacitor
- 2 100 ufd 12V Electrolytic Capacitor
- 1 3.2 ohm 4 inch Permanent Magnet Speaker used as a Microphone and Speaker
- 1 Transformer, miniture, 500 ohm center tapped to 3.2 ohm voice coil
- 2 Transistors, PNP 2SB32
- 1 Transistor, PNP 2N301
- 1 Double Pole Switch



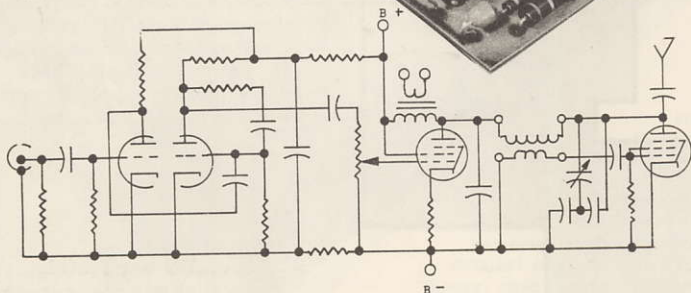
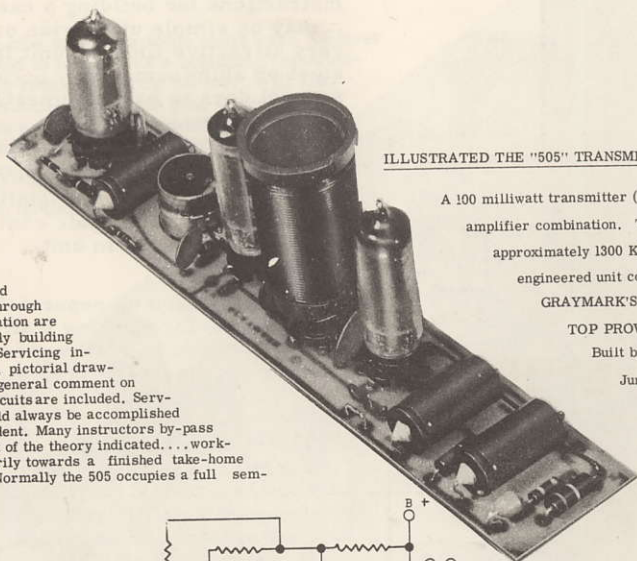
505A

# ILLUSTRATED THE "505" TRANSMITTER/AMPLIFIER

A 100 milliwatt transmitter (FCC #15, 204) and amplifier combination. Transmits at approximately 1300 KC. A well engineered unit compatible with GRAYMARK'S AM Tuners. TOP PROVEN BOY APPEAL! Built by count-less

Junior high school students.

Students ranging from 8th and 9th grade through adult education are successfully building the 505. Servicing instructions, pictorial drawings, and general comment on printed circuits are included. Servicing should always be accomplished by the student. Many instructors by-pass all or part of the theory indicated....working primarily towards a finished take-home project. Normally the 505 occupies a full semester.



## PARTS INCLUDED WITH 505 TRANSMITTER/AMPLIFIER

Instruction booklet (12 pages) include pictorial, servicing instructions, etc.

- TS1 - 7-pin miniature tube socket, Sylvania #7470-0102 Printed Circuit
- TS2 - 7-pin miniature tube socket, Sylvania #7470-0102 Printed Circuit
- TS3 - 9-pin miniature tube socket, Sylvania #7490-0080 Printed Circuit
- TS4 - Octal tube socket, Sylvania #7480-0106 Printed Circuit
- V1 - 50C5 GRAYMARK vacuum tube or TEN BRAND as available.
- V2 - 50C5 GRAYMARK vacuum tube or TEN BRAND as available
- V3 - 12AX7 GRAYMARK vacuum tube or TEN BRAND as available  
12 AT7 may be substituted.

T-1 - 2500 ohm to 3 ohm, 2 watt, audio output transformer

J1 - RCA type phono jack with plug

- C1 - 20 MFD, 150 Volt Electrolytic Capacitor Elna 21092
- C2 - 20 MFD, 150 Volt Electrolytic Capacitor Elna 21092
- C3 - 20 MFD, 150 Volt Electrolytic Capacitor Elna 21092
- C4 - 83 MMFD, Solar GMV, 400 Volt disc ceramic
- C5 - .01 MFD, Solar GMV, 400 Volt disc ceramic
- C6 - 20 MFD, 150 Volt Electrolytic Capacitor Elna 21092
- C7 - .005 MFD, Solar GMV, 400 Volt disc ceramic
- C8 - .01 MFD, Solar GMV, 400 Volt disc ceramic
- C9 - .005 MFD, Solar GMV, 400 Volt disc ceramic
- C10 - 470 MMFD, Solar 20%, 400 Volt disc ceramic
- C11 - 100 MMFD, Solar 20%, 400 Volt disc ceramic
- C12 - 100 MMFD, Solar 20%, 400 Volt disc ceramic
- C13 - .001 MFD, Solar GMV, 400 Volt disc ceramic
- C14 - .01 MFD, Solar GMV, 400 Volt disc ceramic

- R1 - 27 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R2 - 500,000 ohm, 1 watt potentiometer with switch
- R3 - 1000 ohm, 1 watt, 10% Allen Bradley Type EB
- R4 - 27 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R5 - 330 ohm, 1/2 watt, 5% Allen Bradley Type EB
- R6 - 47,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R7 - 47,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R8 - 220,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R9 - 1,500,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R10 - 2,700,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R11 - 2,700,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R12 - 220,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R13 - 22,000 ohm, 1/2 watt, 10% Allen Bradley Type EB
- R14 - 4,700 ohm, 1/2 watt, 5% Allen Bradley Type EB
- B1 - Copperclad board etched

This illustrates typical instructions on a GRAYMARK unit.

**5050A**

Instructions for building a case  
.. may be simple utilitarian or  
very attractive finished unit from  
steel or aluminum. May occupy  
several days to half a semester.

Parts Identification keys  
instruction on recognition  
of basic electronic com-  
ponents used in unit.

Filaments.. hooked up separately  
and plugged in for working test.  
Keys explanation on series circuit,  
voltage drop, Kierkuff's law, etc.

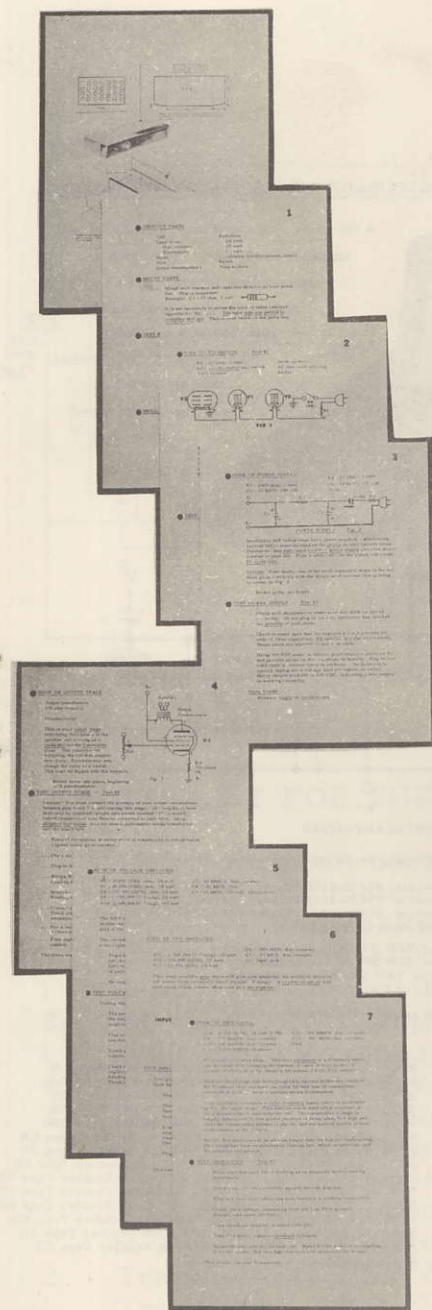
Power Supply  
Functions separately for  
complete test....  
demonstrates filtering,  
peak voltage, use of scope  
to measure ripple, half  
wave power supply, rectifiers,  
etc.

Output Stage  
Functions separately. Keys  
tube theory, measurements  
of current and voltage,  
impedance, etc.

Voltage Amplifier... Working  
test demonstrates servicing, grid  
bias, expansion of tube theory.

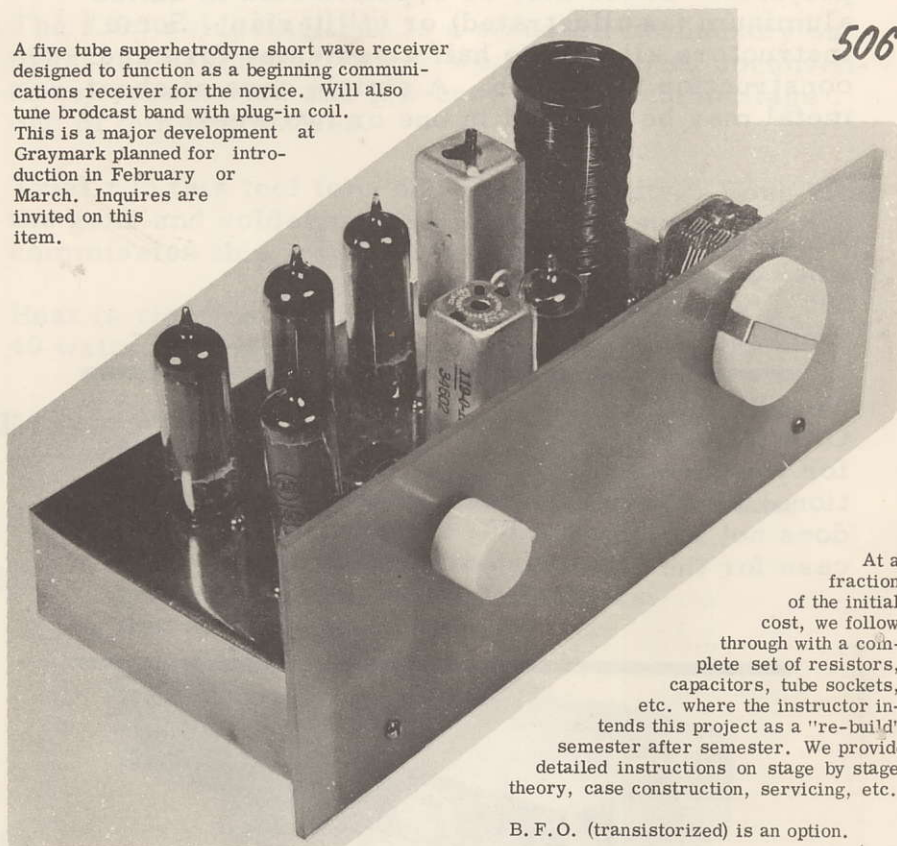
Pre-Amplifier... Extension of  
Tube theory, and more  
sophisticated circuitry.

Oscillator  
Basic theory related  
to function of an  
oscillator, frequency,  
modulation, etc.



SPARE PARTS INCLUDED WITH EVERY UNIT WHEN ORDERED BY LOT.

A five tube superhetrodyne short wave receiver designed to function as a beginning communications receiver for the novice. Will also tune broadcast band with plug-in coil. This is a major development at Graymark planned for introduction in February or March. Inquires are invited on this item.



At a fraction of the initial cost, we follow through with a complete set of resistors, capacitors, tube sockets, etc. where the instructor intends this project as a "re-build" semester after semester. We provide detailed instructions on stage by stage theory, case construction, servicing, etc.

B. F. O. (transistorized) is an option.

#### TENTATIVE PARTS LIST

- R1 - 500K, Variable Resistor with switch
- R2 - 22K, 1/2 watt, 10% Allen Bradley Type EB
- R3 - 100, 1/2 watt, 10% Allen Bradley Type EB
- R4 - 2.2M, 1/2 watt, 10% Allen Bradley Type EB
- R5 - 6.8M, 1/2 watt, 10% Allen Bradley Type EB
- R6 - 470K, 1/2 watt, 10% Allen Bradley Type EB
- R7 - 470K, 1/2 watt, 10% Allen Bradley Type EB
- R8 - 150, 1/2 watt, 10% Allen Bradley Type EB
- R9 - 1K, 1 watt, 10% Allen Bradley Type EB
- R10 - 27, 1/2 watt, 10% Allen Bradley Type EB

- C1 - 8 to 162 MMFD, 10 to 365 MMFD
- C2 - .05 MFD, 200V, Capacitor
- C3 - 47 MMFD, 500V, Mica Capacitor
- C4 - 250 MMFD, 500V, Mica Capacitor
- C5 - .005 MMFD, 600V, Solar disc ceramic
- C6 - 250 MMFD, 500V, Solar disc ceramic
- C7 - .005 MMFD, 600V, Paper Capacitor
- C8 - .01 MMFD 600V, Solar disc ceramic
- C9 - 20 MFD, 150V, Electrolytic, Elna 21092
- C10 - 20 MFD, 150V, Electrolytic, Elna 21092
- C11 - 20 MFD, 150V, Electrolytic, Elna 21092

- L1 - Plug in coil bobbin, octal
- L2 - Oscillator coil, slug tuner
- L3 - 455KC Transformer - Input IF
- L4 - 455KC Transformer - Output IF

- V1 - 35W4, Rectifier, Graymark
- V2 - 50C5, Power Output, Graymark
- V3 - 12AT6, Detector-AVC, Graymark
- V4 - 12BA6, IF Amplifier, Graymark
- V5 - 12BE6, Converter, Graymark

- T1 - 2500/3 ohm, Output Transformer

Instruction Booklet



GRAYMARK provides very complete instructions on construction of cases for the 505 and other projects. Cases may be sophisticated in buffed aluminum (as illustrated) or utilitarian. Some instructors allot up to half a semester for case construction and finish. A simple case of sheet metal may be finished in one or two weeks.

We do not furnish or stock a case for the 505 Transmitter/Amplifier.

We will build up any GRAYMARK project for you for an additional \$3.00. This does not include a case for the 505.



Instructors are urged to note the specifications carefully on the following pages.

Components are all of commercial quality.... many meet military specifications as noted.

The remark "It can't be any good at that price!" has proven to be a surprise hurdle!

All components and projects are guaranteed to be exactly as represented.

300



The #300 soldering iron is a standard in industry on overseas assembly lines. We hope that its unconventional appearance and low cost will not camouflage one of our best values.

Trial run this tool for "boy-proof" ability. Long after the guns and soldering pencils have been put out of commission this iron will be functioning.

Heat is right on printed and point to point circuits ... 40 watts. Available as a kit in September 1962.

---

301

Diodes suitable for crystal tuner and similar applications. Each diode checked in tuner before shipment.

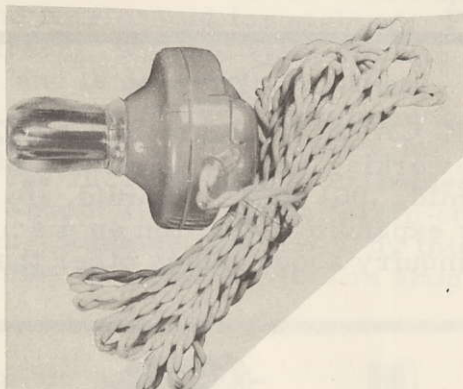
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302

Power diode rated at 100 mils, 200 V P. I. V. Suitable for half wave power supplies, voltage doublers, and similar applications.

---

303



A quality crystal earphone. Try this 'phone as a microphone. We ran a blindfold test using a standard crystal microphone against the 303. For speech the 303 nearly matches microphones costing ten or more times as much.

Unconditionally guaranteed for highest gain in use with crystal tuners. Excellent for use with the 505 Transmitter/Amplifier for this minimum investment.

304

Line Plug of high quality



305

TELESCOPING ANTENNA for miniature pocket and transistor radios, Transceiver Applications and Amateur use. Made of chrome plated brass, antenna has 5 sections--pulls out to 38 inches extension, plugs into jack provided. Retracts to 9 inches for carrying in pocket. Flexible plastic case with protecting flap included.

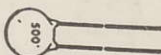
PRINTED CIRCUIT BOARD suitable for shop use by students. Spauldite XXXP copper clad 1 oz 1 side.

306 Solder Blister Resistance: 8 sec. at 500° F.  
Tensile Strength P. S. I. LW: 13,000

306A Dielectric Constant 1 M. C.: 4.6  
MIL-P-3115

May be sheared on squaring shears, sanded to size, or cut with a coping saw. Two sizes available: 306 (1 7/8 by 10 inches) 306A (2 3/4 by 3 3/4 inches.) Expanded offering later.

307A



DISC CERAMIC CAPACITORS by SOLAR CORP., Los Angeles. 500 working Volts. 47 mmfd, 80 mmfd, 100 mmfd, 470 mmfd, .001 mfd, .005 mfd, .01 mfd. We are constantly expanding selection on disc ceramics. Please make inquiry about values other than listed.

307B



20 MFD, 150 V ELECTROLYTIC. Conservatively rated and of unique small size for this value and voltage rating. Ideal for filter capacitors in limited space applications particularly on printed circuit boards. Applicable to voltage doubler circuits.



307C

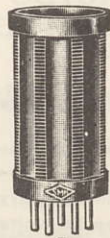


TRIMMER CAPACITOR rated 6 to 166 mfd. The only trimmer we know on the U. S. market which will withstand R. F. at relatively high voltages. Priced competitively with units which will not take R. F. or voltages in excess of 100 V.

---

308

Plug in coil bobbin, octal



309

CLEAR PLASTIC COIL FORM 5" by 1 1/2" O. D.

---

310

AMMONIUM PERSULFATE in granulated crystal form for etching printed circuit boards. Far superior to Ferric Chloride and Nitric Acid for etching. Fast, (about 8 minutes when fresh), will not stain clothing, forms a clear solution, and is non-toxic on hands. Widely used commercially. One pound will etch many boards. Should be heated to about 100° or more for speed in etching. This has recently proved extremely successful in a number of school shops where ferric chloride was previously used. Students fascinated by this commercial process which may be demonstrated in shop due to fast reaction time.

---

311

RCA PHONE JACK.



311A



Conventional plug of the RCA phone plug type. We formerly supplied a smaller jack and plug similar to those seen on transistor radios. Experience has shown that this larger more rugged unit is superior in the school shop.

312



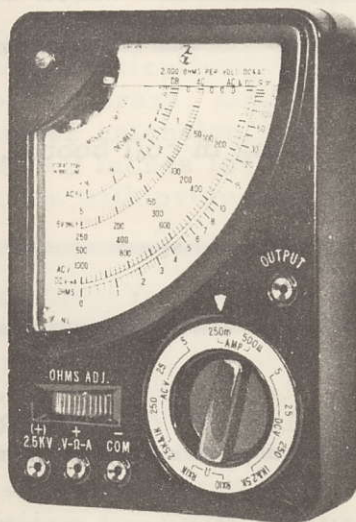
BAR TYPE POINTER KNOB. Available in six colors which we ship mixed. Has rugged brass bushing for shaft diameter 1/4 inch. Attractive unit compatible with most front panel designs and colors.

313

### 2000 OHM AC/DC VOLT OHM METER

#### 1% PRECISION RESISTORS

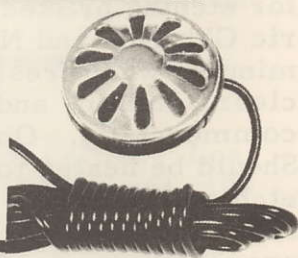
Rugged, accurate pocket meter with large, easy-to-read dial and 2K ohm per volt movement. Ranges: DC Volts: 0-5-25-250-1 KV-2.5KV at 2K ohms per volt. AC Volts: 0-5-25-250-1KV-2.5 KV at 2K ohm per volt. DC Current: 0-250, 0-500 microamps. Resistance: X 10, X 1000 Decibels: -20 to +16db. Case measures 3 1/4" x 4 1/2" x 1". Complete with test leads, battery and explicit instructions.



314

### LAPEL MIKE

Small, light-weight speech type crystal cartridge in bright gold and black case. Complete with spring lapel clip on back and plastic covered coaxial cord.



315

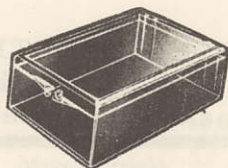
NE-2 NEON LIGHT of U.S. origin. Useful in many circuits. Leads extend one inch, glass envelope has O. D. 1/4 inch.

316

PRINTED CIRCUIT BALL POINT PEN. Will leave clean line of resist on copper clad. Extremely useful for circuit experimentation by students. A quick and inexpensive method of building up prototype circuits. Simply mark the circuit at hand on a board, allow to dry (about 15 minutes) and etch for a completed printed circuit board. Pen contains large quantity of resist for many circuits. Far superior to circuit layout using tape or brushes.

317

$3\frac{1}{2}'' \times 2\frac{1}{16}'' \times 1\frac{1}{8}''$   
 $\frac{1}{4}''$  Cover  
 $\frac{3}{8}''$  Bottom



CLEAR PLASTIC BOX ideal in size for many projects. May be student drilled, sprayed, etc.

317A

Same as above except lower half blue. Morse code imprinted on top of clear lid.

318



Red.

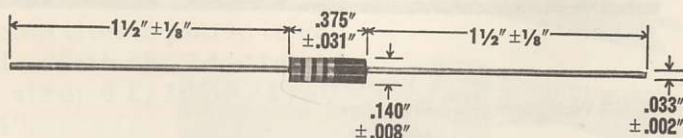
TEST PROBES of excellent quality 5 inches in length. Uses "solderless" fitting for test probe wire.

318A

Probe same as above.

Black.

319

**Characteristics**Type EB —  $\frac{1}{2}$  Watt 10%**Maximum Continuous Rated Voltage**

350-V-RMS

**Maximum Continuous Rated Watts at 70°C Ambient**

0.5

**Insulation Strength**

Plus 2 × 350 volts

**Voltage Coefficient**

Maximum Resistance Change per Volt

1000 ohms	.005%
10000 ohms	.007%
0.1 megohms	.014%
1.0 megohms	.020%
10.0 megohms	.030%

Resistor values stocked:

27 ohms	4.7K ohms	1.5 megohms
100 ohms	22K ohms	2.7 megohms
150 ohms	100K ohms	6.8 megohms
270 ohms	220K ohms	
330 ohms	470K ohms	
1000 ohms		

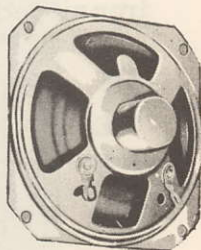
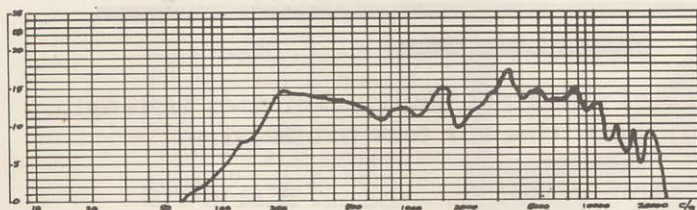


**500K POTENTIOMETER WITH SWITCH** (as used on our 505 and 506). Long shaft (1 3/8 inches) and smooth travel make this a standard for the school shop.

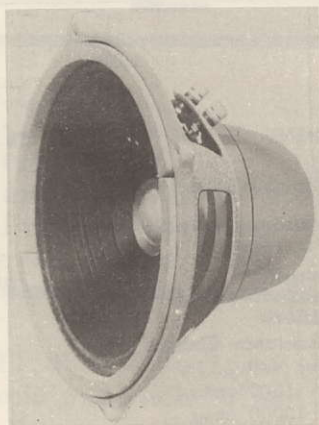
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**321 SPEAKER 4"** This precision speaker was carefully designed and constructed for replacement of any 4" radio, television or phonograph speaker. 0.3 Watt, 8 ohms, .68 magnet capped.

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### 321A



Here is a speaker designed for use with your hi-fi equipment. It is moderately priced with a range of 60 to 16,000 cps, and has good power handling capabilities. Full input can be applied without distortion due to the special cone treatment. Excellent response will be obtained when enclosed in a proper baffle. Highly recommended for your stereo installation.

### Specifications

Nominal size	8 inch		
Power input	8 watts, continuous	Flux density	10,000 gauss
	12 watts, program material	Magnet weight	5.7 oz
Frequency Range	60 to 16,000 cps	Dimensions	diam. 8"; depth 5
Cone resonance	60 cps	Baffle opening	7 inch
Voice coil impedance	8 ohms	Weight	3.3 lb

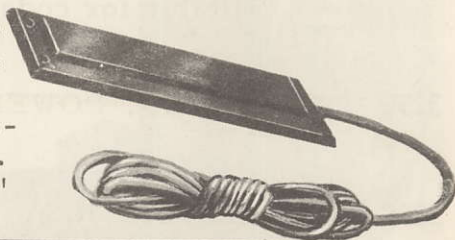
### 322 SLIDE SWITCH

Miniature switch with smooth-sliding bakelite handle on metal body; 1 3/8". 0.5 amps, AC or DC. DPDT.



### 323 TELEPHONE PICK-UP COIL

Picks up both sides of phone conversation and feeds tape recorder, amplifier, etc. No connection to phone is required. With shielded lead. Small size; 4 1/2" by 1 1/2" by 1/4".



### 324 PRINTED CIRCUIT TUBE SOCKETS (as used in our 500 and 505) Conventional tube sockets as illustrated.



7 PIN PC



9 PIN PC



7 PIN



9 PIN

### 324A TUBE SOCKETS OCTAL



Printed circuit



8 PIN

## 325 TRANSISTORS

PNP Type 2SB32 (similar to 2N405, 2N406)

Low Frequency Germanium Alloy Junction Type.

A high gain "driver" class of transistor suitable for use in many simple student circuits.

hfe 40

$I_{cbo}$  -14V

$P_c$  150

This is not a reject transistor of the type usually seen at this price but a standard imported type very widely used in Transistor Radios, etc.

Used in our 504A.

## 325A TRANSISTOR, NPN

Suitable for code oscillator.

## 325B TRANSISTOR, POWER

## 325C TRANSISTOR, R. F.

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## 326 TUBES.

All vacuum tubes are checked in the circuit for which they are intended prior to shipment. All are fully guaranteed and replacement will be prompt.

Available February 1st:

6C4

12BA6

12AT6

12BE6

12AT7

35W4

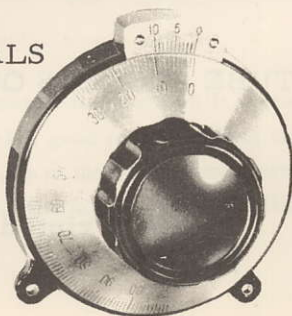
12AX7

50C5

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## 327 PRECISION VERNIER DIALS

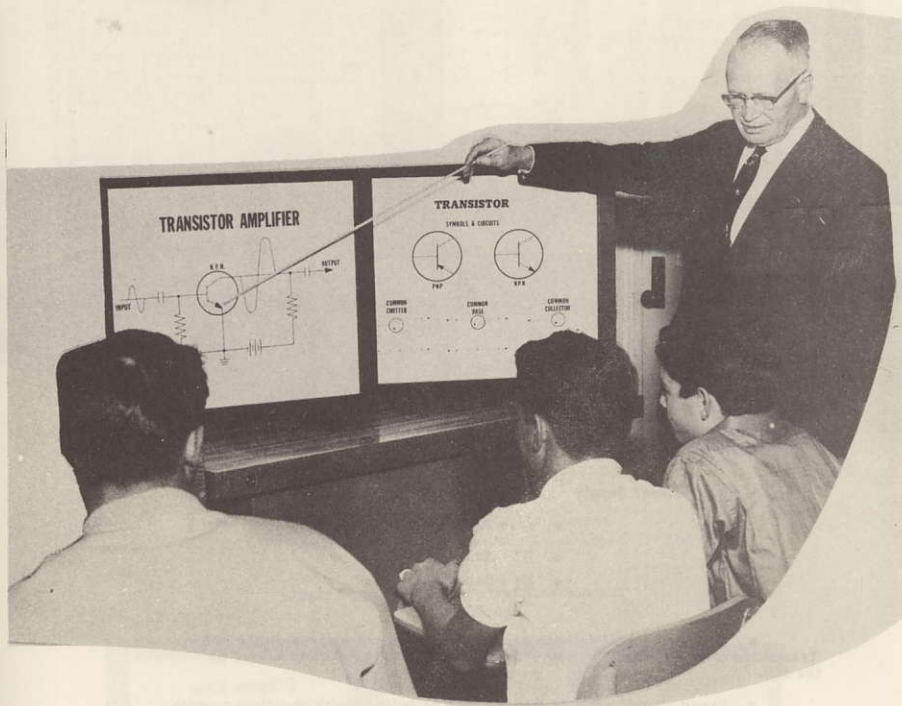
8:1 RATIO precision vernier dials with a heavy black bakelite base and nickel-silver dial plates with deeply etched, clearly legible scales. Moulded knob with fluted grip. Internal parts of phosphor bronze and brass for long-life dependability. Calibrated 0 to 100 in 180° rotation. For front panel mounting.





# IMPACT....

- Visualization to students of a meaningful working circuit
- Dramatize Electronics to community and administrators
- Printed in color on clear plastic sheets

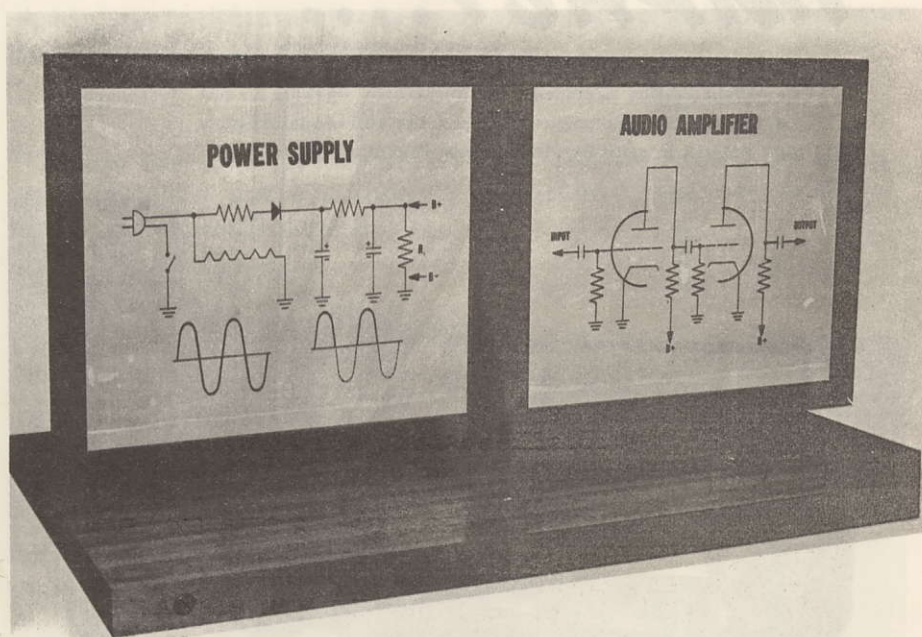


## ILLUSTRATED

## Series #707 Transistor Set

- T4 Transistor Amplifier; Visualizes transistor amplification, bias, etc.
- T9 Transistor Symbols and Circuits; Details the common transistor symbols and circuit applications.
- Also Available
- T12 Semiconductors; Explains materials, construction and bias conditions found in most semiconductor applications

# SERIES #720 TRANSMITTER/AMPLIFIER SET



• B2 Power Supply

• B4 Audio Amplifier

• Also Available

• B7 Audio Output

• B8 Oscillator Stage

• Designed specifically to accompany class instructions on the 505 Transmitter/Amplifier. The above set is a complete instruction series on the 505.

• Every circuit panel in this set may be built up with excellent results.

• All panels come with detailed instructions on:

- . . . functions of each component in the circuit
- . . . function of each stage
- . . . troubleshooting methods on each stage

• Parts available for the above panels by ordering one 505 Transmitter/Amplifier kit.

• Complete instruction manuals for the 505 Transmitter/Amplifier are available. Detailed instructions to the student to bring alive the use of test equipment and the related theory of each circuit.

# SERIES #741 COMPONENTS & TERMINOLOGY SET

## CT7 Vacuum Tubes

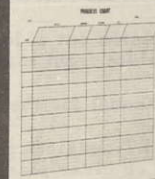
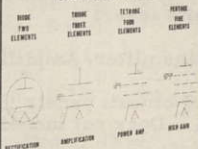
- Shows four basic tube configurations.



## CT1 Resistors

- Color Code -
- Tolerance -
- Wattage

## THE VACUUM TUBE

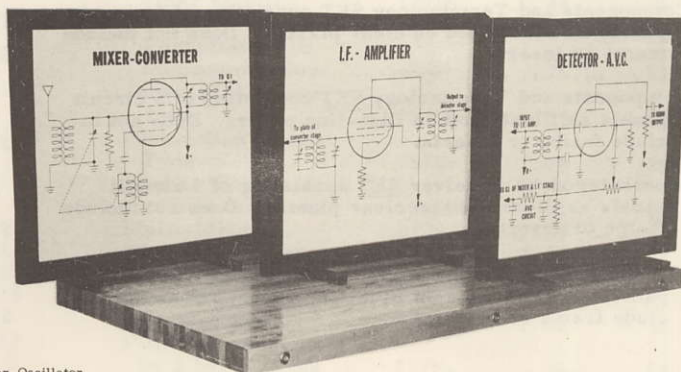


## CT10 Progress Chart

- Keep an entire semesters work record on one chart.

- Also Available
- CT2 Capacitors: Showing symbols and capacitor functions.
- CT3 Transformers: Shows symbols and circuit applications.

# SERIES #777 SUPERHETERODYNE RECEIVER SET



## SR3 Mixer-Oscillator

## SR4 I. F. Amplifier

## SR6 DETECTOR

- Also Available

SR1 Power Supply: Shows graphically the operation of a full and half wave vacuum tube rectifier.

- SR9 Audio Output: Showing the output stage of the superhet receiver.



The 700 series are available silk-screened in color on heavy clear plastic (acetate). The plastic is shipped in rolls. Adherence to any smooth surface (the inserts are ideal) is permanently assured with the use of a gum bond already provided on the acetate.

Masonite inserts sprayed white on one side are included with the frame and are not provided unless frame is ordered separately.

The instructor may write with a grease pencil on the acetate and remove and clean with a damp cloth. The circuit panel is an instructional aid which will withstand many semesters of hard use.

Instructors are encouraged to build up working circuits on the panels. Instructions for this and circuit theory related to each panel is provided.

The series #700 CIRCUIT PANELS are available in a wide variety of forms and materials:

#700	Clear plastic with imprinted circuits in color 20" by 24" (does not include masonite insert or frame)	\$ 2.15 ea
#700B	Blue-Line reproduction on heavy white paper 20" by 24" (does not include masonite insert or frame)	\$ 1.39 ea
#799	Frame, precision cut of heavy 1-3/8 in. square white pine with white front masonite insert	\$ 3.79 ea
#780	Instruction Manual for the Transmitter/Amplifier	\$ 0.30 ea
#707	Transistor <u>SET</u> consisting of 3 circuit panels as illustrated on clear plastic. Does not include frame or inserts.	\$ 6.00 set
#707B	Transistor <u>SET</u> consisting of 3 circuit panels as illustrated on Blue-line paper. Does not include frame or inserts.	\$ 3.25 set
#720	Transmitter/Amplifier <u>SET</u> consisting of 4 circuit panels as illustrated on clear plastic. Does not include frame or inserts.	\$ 8.00 set
#720B	Transmitter/Amplifier <u>SET</u> consisting of 4 circuit panels as illustrated on Blue-line paper. Does not include frame or inserts.	\$ 4.50 set
#741	Components and Terminology <u>SET</u> consisting of 5 circuit panels as illustrated on clear plastic. Does not include frame or inserts.	\$10.00 set
#741B	Components and Terminology <u>SET</u> consisting of 5 circuit panels as illustrated on Blue-line paper. Does not include frame or inserts.	\$ 5.65 set
#777	Superheterodyne Receiver <u>SET</u> consisting of 5 circuit panels as illustrated on clear plastic. Does not include frame or inserts.	\$10.00 set
#777B	Superheterodyne Receiver <u>SET</u> consisting of 5 circuit panels as illustrated on Blue-line paper. Does not include frame or inserts.	\$ 5.65 set

#### SAMPLE ORDER:

#700-T4, #799	Indicates one clear plastic circuit in color on the TRANSISTOR AMPLIFIER with one frame and masonite insert.	Total Cost	\$ 5.94
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# CONFIDENTIAL JOBBER PRICE LIST

Effective February 1st, 1962

Part No.	Description	Shpg wt lbs	Price each	Lot Price	In Lots of:
300	Soldering Iron	9 oz	.99	.75	10
301	Diodes for Crystal Tuners	50/lb	.15	.10	25
302	Diodes, Power 100 mil, 200VPIV	1/2 lb	.57	.43	10
303	Crystal Earphone/ Microphone	25/lb	.37	.30	10
304	AC Line Plugs	25/lb	.09	.06	25
305	Antenna, Vertical Telescoping with five Sections 38 in.	10/lb	1.37	.99	10
306	Board, Printed Circuit 2 1/2 by 3 1/2 inches, Type XXXP	35/lb	.29	.22	10
306A	Board, 1 7/8 by 10 in. XXXP	20/lb	.35	.29	10
307A	Capacitors, Disc Ceramic all values appearing in any project	200/lb	.10	.06	25
307B	20 UFD, 150V Elna Filter Capacitors	30/lb	.32	.24	25
307C	Trimmer Capacitors ARCO 463 4 - 166 MFD	50/lb	.29	.24	10
308	Coil Forms Plug-in to any octal socket	15/lb	.39	.29	10
309	Coil Form for Crystal Tuner 5 by 1 1/2 O.D. clear plastic	12/lb	.44	.36	10
310	Etch Ammonium Persulfate 5 lb minimum order	—	.75/lb	.71/lb	10
311	Jack, RCA Phone Type	75/lb	.06	.05	25
311A	Plug, RCA Phone Type	75/lb	.06	.05	25
312	Knobs, Pointer type with brass insert	55/lb	.11	.09	10
313	Multi-Meter	1/lb	7.95	7.66	4
314	Microphone, lapel	4/lb	2.29	1.97	5
315	Neon Light, NE-2	250/lb	.09	.08	25
316	Printed Circuit Pencil (Resist Ink)	8/lb	1.63	1.49	5
317	Plastic Boxes 1 1/4 by 3 5/8 by 2 5/8	12/lb	.16	.12	25

TEAR OFF

TEAR OFF

# CONFIDENTIAL JOBBER PRICE LIST

Effective February 1st, 1962

Part No.	Description	Shpg wt lbs	Price each	Lot Price	In Lots of:
317A	Same in blue with code on clear top	12/lb	.18	.14	25
318	Probes, 5 in. solderless Red	35/lb	.12	.10	25
318A	Probes, 5 in. solderless Black	35/lb	.12	.10	25
319	Resistors all values (see catalog list)	400/lb	.045	.03	100 (mixed)
320	Potentiometer, 500K with switch	12/lb	.49	.41	10
321	Speaker, 4-inch	3/lb	1.29	.99	10
321A	Speaker, 8-inch Extended range	3/lb	9.95	8.59	5
322	Switch, Slide DPDT	60/lb	.18	.16	10
323	Telephone Induction Pickup	5/lb	1.74	1.18	5
324	Tube Socket 9-pin 7-pin miniature Printed Circuit or conventional	75/lb	.09	.05	25
324A	Tube Socket octal Printed Circuit or conven.	45/lb	.12	.09	25
325	Transistors, 2SB32 (see spec. in catalog)	250/lb	.66	.56	10
325A	Transistors, NPN Suitable for code osc.	250/lb	.66	.56	10
325B	Transistors, Power	_____	Price to be established		
325C	Transistors, R. F.	_____	Price to be established		
326	Tubes.	_____	.71	.55	10
327	Vernier Dial	_____	Price to be established		
500	Tube Filament Checker/Continuity Meter	2/lb	1.41	1.11	10
501	Code Oscillator	3/lb	2.44	1.98	10
502	Crystal Tuner	2 for 3 lbs	1.99	1.49	10
503	F. M. Tuner - Please write for availa- bility date if interested	1/lb	6.25	5.25	5
504	Transistor Amplifier/ Intercom	4/lb	5.39	4.39	5
505	Transmitter/Amplifier	1/lb	6.23	4.95	6
506	Short Wave Super- hetrodyne	1/lb	8.75	7.49	5
507	Rebuild parts for Superhet	_____	2.45	1.97	5

TEAR OFF

TEAR OFF



## HOW TO ORDER:

We prefer to bill on your school purchase order number. Cash plus postage or C. O. D. is also acceptable. C. O. D. adds to your cost and must be accompanied by 25% of your order. Please use school letterhead or forms.

Orders of less than \$5.00 are impossible to fill with our low margins.

Prices are net, F. O. B. Los Angeles. All trade discounts have been deducted from the lot prices.

Cash by check or U. S. Postal Notes. Allow postage using these tables and our price list for weight.

### PARCEL POST RATE TABLE

**Postal Regulations...**limit parcel post shipments to 20 pounds to zones 3 to 8, and 40 pounds to zones 1 and 2. **EXCEPTION:** Shipments up to 70 pounds will still be accepted to RFD addresses, and to APO numbers.

Ship. Wt.	Local	Zone 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
to 2 lbs.	\$.24	\$.33	\$.35	\$.39	\$.45	\$.51	\$.58	\$.64
3 lbs.	.26	.38	.41	.47	.55	.64	.74	.83
4 lbs.	.28	.43	.47	.55	.65	.77	.90	1.02
5 lbs.	.30	.48	.53	.63	.75	.90	1.06	1.21
6 lbs.	.32	.53	.59	.70	.85	1.03	1.22	1.40
7 lbs.	.34	.58	.65	.77	.95	1.16	1.38	1.59
8 lbs.	.36	.63	.71	.84	1.05	1.29	1.54	1.78
9 lbs.	.38	.68	.77	.91	1.15	1.42	1.70	1.97
10 lbs.	.40	.73	.83	.98	1.25	1.55	1.86	2.16
11 lbs.	.42	.77	.89	1.05	1.35	1.67	2.02	2.34
12 lbs.	.44	.81	.95	1.12	1.45	1.79	2.18	2.52
13 lbs.	.46	.85	1.01	1.19	1.55	1.91	2.34	2.70
14 lbs.	.48	.89	1.07	1.26	1.65	2.03	2.50	2.88
15 lbs.	.50	.93	1.13	1.33	1.75	2.15	2.66	3.06
16 lbs.	.52	.97	1.18	1.40	1.85	2.27	2.81	3.24
17 lbs.	.54	1.01	1.23	1.47	1.95	2.39	2.96	3.42
18 lbs.	.56	1.05	1.28	1.54	2.05	2.51	3.11	3.60
19 lbs.	.58	1.09	1.33	1.61	2.15	2.63	3.26	3.78
20 lbs.	.60	1.13	1.38	1.68	2.25	2.75	3.41	3.96

GRAYMARK appreciates comments on all products. Advise us on needs not covered by the catalog.

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