

SURPLUS

by **KENNETH B. GRAYSON, W2HDM**

Care of CQ 300 West 43rd Street, N. Y. C. 36, N. Y.

If I were asked which piece of surplus gave you the most for your money I would be forced to say the ARC-5 command sets, but right on the heels of the ARC-5 would be the BC-221 frequency meter. It's hard to find a secondary frequency standard with as much versatility as the 221 for under five hundred dollars, yet that's exactly what the commercial models go for. I've seen a BC-221 go for as little as forty dollars with the calibration book, and in perfect condition. Nowadays, they are still under a hundred and worth every cent.

The BC-221 (and the Navy LM counterpart) is a portable frequency meter of the heterodyne type capable of accuracies of 25 cycles at 20 *mc*, to the nearest kilocycle. The 221 covers two bands, namely 125 *kc* to 2000 *kc* and 2000 *kc* to 20,000 *kc*. Essentially it is a highly stable, well calibrated oscillator with a low frequency range of 125 to 250 *kc* and a high frequency range of 2000 to 4000 *kc*. By means of harmonics, the complete range is covered. The companion calibration book is individually calibrated for its own BC-221 and carries the same serial number as the frequency meter itself. The slight error which may occur due to temperature changes, aging of tubes etc, is accounted for by checking the calibration against the 1000 *kc* standard built into the equipment, and compensating the calibration by a fine trimmer known as the corrector. Many frequency check points occur over the band, and errors can be reduced to as low as 0.02 percent.

In use, the frequency meter is turned on and, in the case of an oscillator or transmitter, beat against the unknown signal. The frequency meter has a detector and an audio amplifier so

that the beat is heard in a pair of high impedance earphones. The calibration of receiver is very simple. The 221 is set to a particular frequency and the receiver tuned so as to receive the 221's signal. In some models of the frequency meter a modulated signal is available so the *bfo* of the receiver need not be turned on, but this is only in the later models.

The *rf* signal required to operate the BC-221 is relatively small, and only a short length wire for pickup is needed. As a special note, don't connect it directly to the antenna or to a transmitter. Near the antenna is close enough. Likewise when testing a receiver, don't couple the frequency meter directly, but instead connect a short piece of wire to the 221 antenna post and just bring it near enough to allow the receiver's antenna to pick up a signal.

The output of the frequency meter is high enough to allow its use as a fine *vfo*. A cathode follower may be necessary in some cases to prevent loading of the output.

Conversion of the BC-221 is practically negligible except for the power supply to take the place of the batteries and a modulator. We're indebted to DL4VG (W9YUE) who came up with the modulator last year for us. I'm sure that he thought we forgot all about it, but it's well worth passing on and requires very few parts. It is shown in fig. 1. It will allow you to tune up that receiver, under AM conditions, to the exact frequency and be right on when that sked is due. It also allows you to use the 221 as a signal generator for accurate alignment.

The power supply is simple. The original power supply used for 1½ volt large cells for fila-

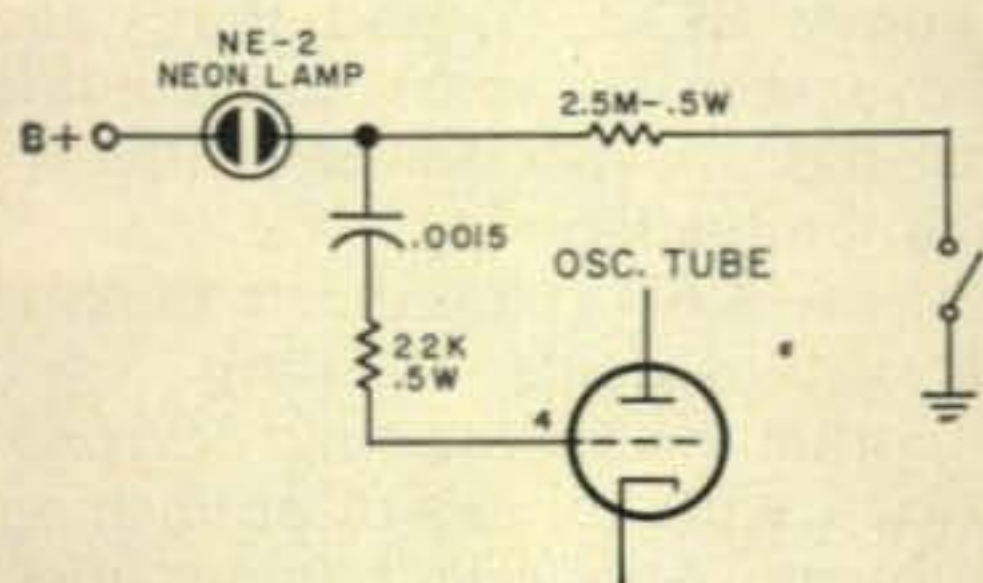


Fig. 1—Simple neon lamp modulator circuit for a 400 cycle tone.

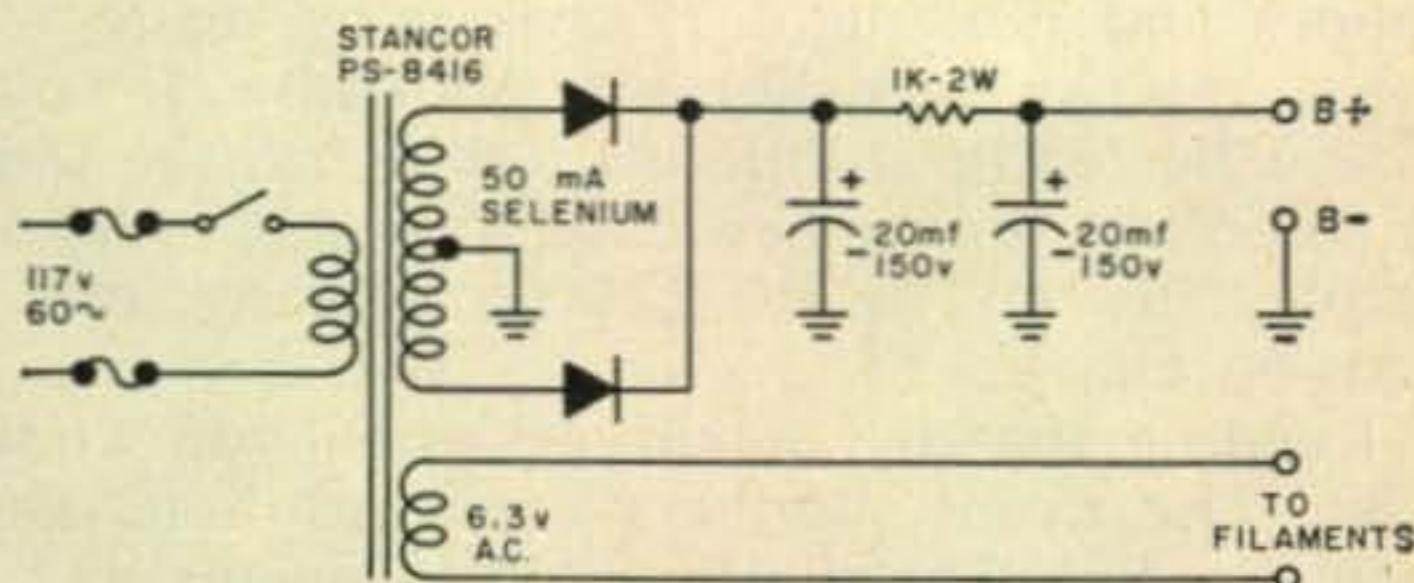


Fig. 2—Full wave power supply to operate BC-221 from the ac line

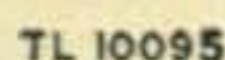


Fig. 3—Circuit diagram of the BC-221 frequency meter.

[Continued on page 105]

frequency (measuring coils, tuned circuits, antenna resonance, etc.); then after your GDO has warmed up for about 20 minutes or so, set IT to the frequency on the receiver dial by zero-beating it, note the zero beat point and proceed with your measurements.

Thirty

We now have our station on the air in France, its call: F7FE. Listen for us on all workable bands using CW, AM and SSB.
73, Chuck, F7FE/W6QLV

SURPLUS [from page 80]

with Cliff and let him know any details that would be of value to hams in general. His address is Box 385, Bonita, California. One thing that would be of special value is the location of a source of brushes for these motors.

In the market for a handbook of diagrams? Well CQ will shortly have a set of books covering all of the surplus equipment that we could locate (including some which have not been released yet). No conversion will be given, just the circuits, which are usually hard to come by, and a little run-down on the peculiarities of each piece of equipment, as well as power requirements.

The imminent publication of the schematic manual doesn't mean that we will change our policy of handbook requests. There will always be a need for specific information regarding some piece of gear that could only be found in the manuals. W1TNQ/9, Bill Briggs of 300 Oak St., Angola, Indiana is looking for a TBY-2 handbook. Special help is wanted by W6FRG, Jonas R. Savage of R-2 Box 900, Vacoville, California who is disabled since the war and is looking for assistance in converting the BC-604 to six meters. Here is a chance to really show the ham spirit to a new ham who, as a disabled veteran, took up the hobby for his health. W6WT is looking for a modification of the TCS to SSB, in the same manner that the DX-100 has been modified of late. K7EWG is looking for a conversion of the B-19, Mark II transceiver for mobile. W6IQM is trying to get hold of a manual for the APR-1. K5JQG is looking for some way of converting the PE-94 to 12 volt operation from 24 volts. This is a dynamotor, and may be in the same category as the PE-101.

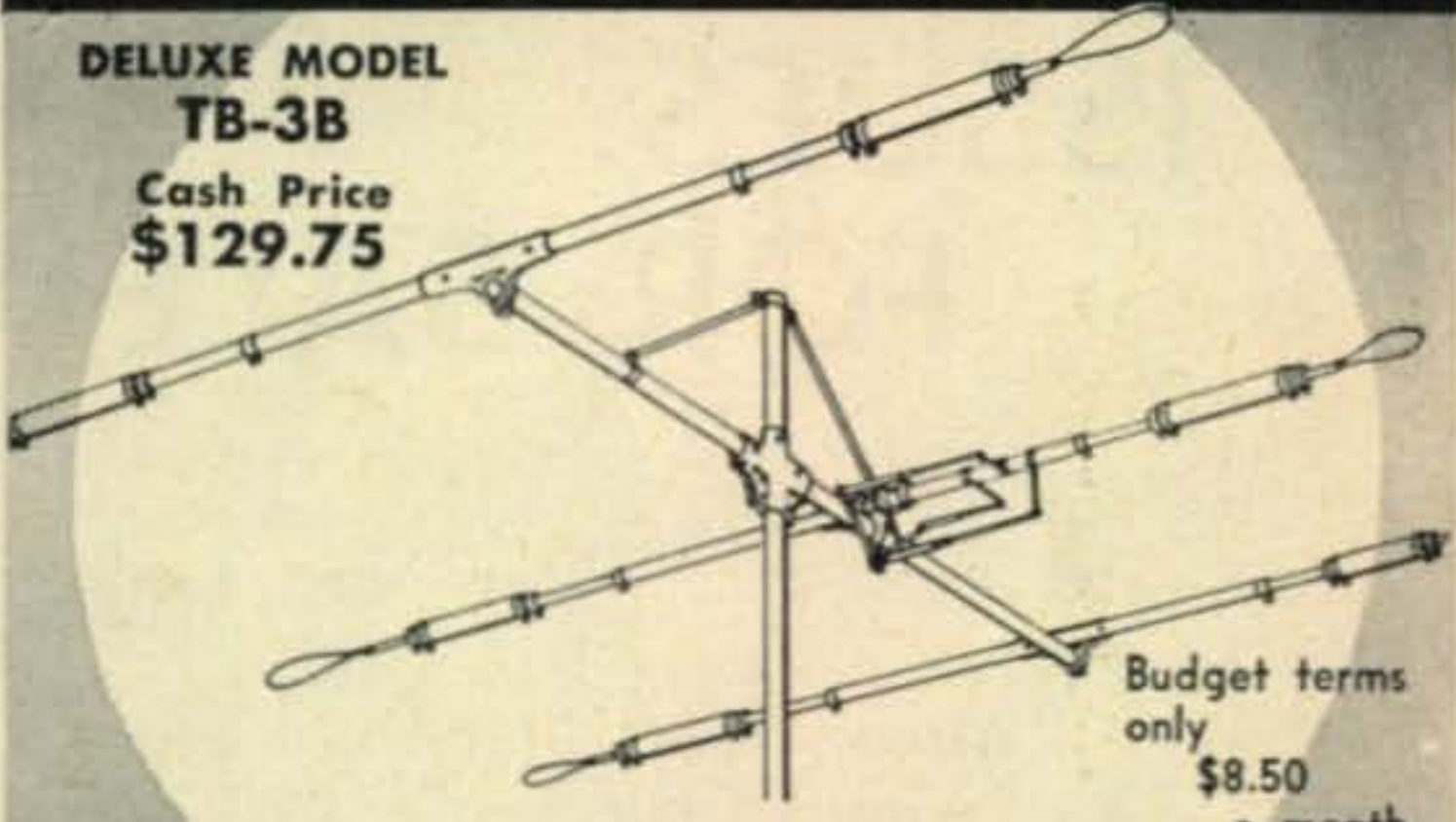
Both Steve Snee, Box 182, Bucknell University, Lewisburg, Pa., and Louis Hiser, 148 Sherman Avenue, Morgantown, W. Va., are looking for a conversion for the BC-620. Specifically they want to convert to AM, but they would like to get the manual as well. Harold Otis, 12328 Shoemaker Avenue, Whittier, California, is also interested in the BC-620 to AM, and the BC-1335 and BC-603 and BC-604.

W. O'Brien, 1534 South Avenue, Syracuse 7, N. Y., needs the RBM manual. Don Scher, 11

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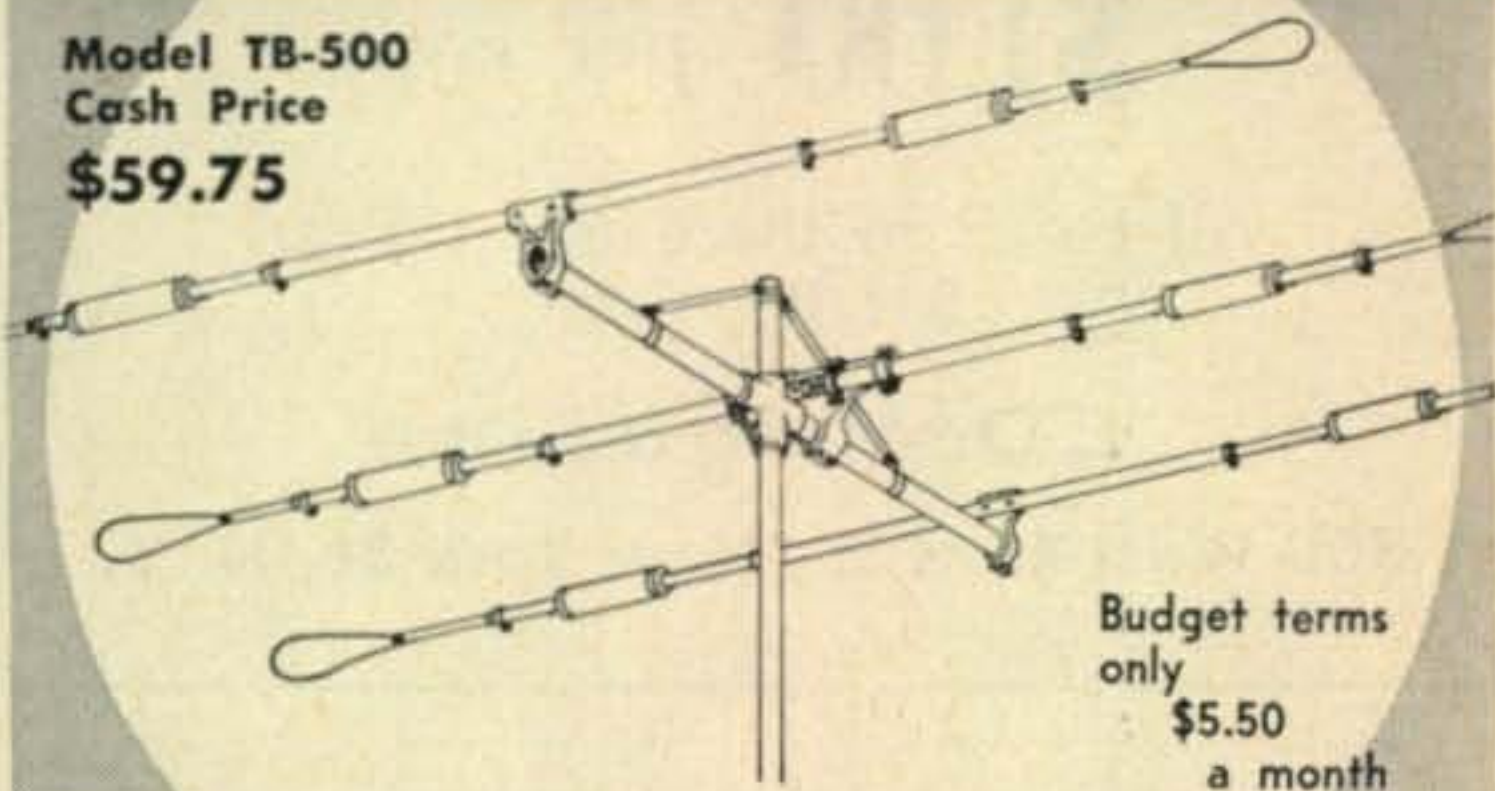
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Webster Street, Irvington, N. J., wants the manuals for the RBL-3, R-28/ARC-5 and the R-44/ARR-5. Joe Kay, K1GQW, has one of the RU-16 receivers and is lacking the manuals or any operating data. The T-4/FRC is new on the surplus market and in need of a handbook for one is Gary L. Koeiner, 1311 Watson Street, Scranton 4, Pa. John Wora, K2KFG, writes that he needs the parts list and schematic for the BC-307-B transmitter. K6ZNK is trying to use his newly purchased BC-779A and would like to get hold of a manual on it.

From Canada, VE1PO writes that he is looking for information on a piece of British built equipment. It bears the nameplate number TR-1935 and model number 2118/3 and 974/2. It also has a reference number 10D/17694. Anybody knowing the whereabouts of suitable instructions for this rig get in touch with Gerald Kennedy VE1PO, 9 Lakewood Drive, Moncton, New Brunswick, Canada.

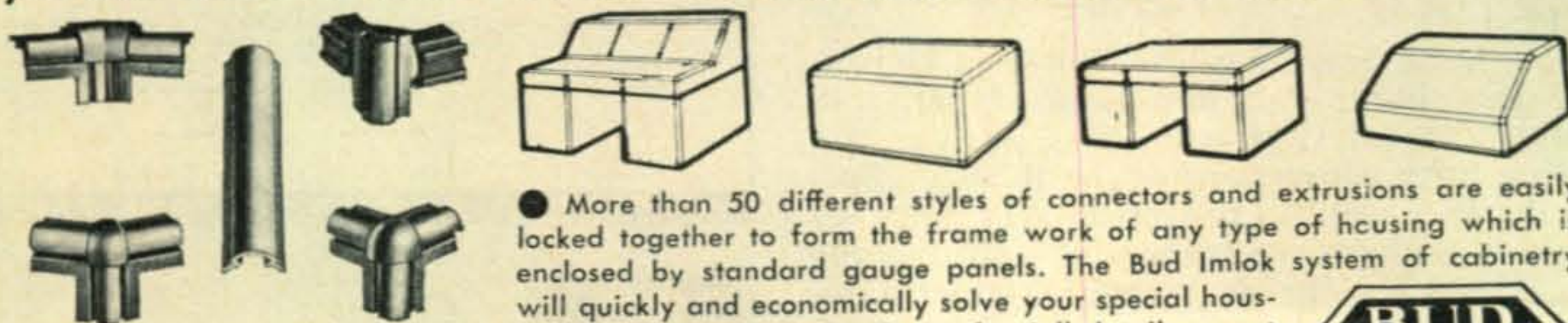
W1ZUH wants the Tech Manual on the TBW-2, while Dale Wayne at 123 North Hyatt Street, Tipp City, Ohio, is in need of the RAK handbook. K5EXW still is looking to hear from someone about the RBM manual. The BC-222 is back again and K2TWY needs the book. Bendix made a radio-compass known as the MN-26. Stephan Collins of 15036-85 Avenue, Edmonton, Alberta, Canada, has one covering the 150 to 1500 kc band and needs conversion information. The schematics for the TBX-4 are needed by W7MBV. Like many others, John Morse, K2KFN has an ART-13, but no info on it. This is new, at the price they are at on the market, and they are well worth the money. They were converted years ago in CQ in Nov. 46, Feb. 48, Dec. 47, and in the Eleventh Edition of the Radio Handbook published by the Editors and Engineers on the West Coast.

73, Ken, W2HDM

SIDEBAND [from page 81]

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