RTTY

NEWS OF AMATEUR RTTY

OCTOBER, 1962

30 Cents

Vol. 10, No. 10

ARTHUR OWEN, G2FUD BILL BRENNAN, G3CQE IN G2FUD RADIO ROOM



## HORSE TRADES

This page of the Bulletin is for use of amateurs who have RTTY EQUIPMENT FOR SALE OR TRADE and those looking for equipment to buy or trade. It is a free service and may be the means of getting someone on the air.

WANTED: XT Table for model 14 typing reperf and 14 TD. S. F. Bowlby, W6FYZ, 1008 West Sixth St., Los Angeles 54, Calif.

FOR SALE: Model 14 TD, gvnd motor metal clutch $75.00. 15 kybd comm. caps $10.00. Model 14 perforator, quick feed-out, adjustable end of line and sound proof cover, $100.00. John Riley, 914 N. Cordova, Burbank, Calif.

FOR SALE: 14 TD $75.00, 14 typing reperf $70.00, 14 keyboard perforator $35.00, Printer test set CA-405-A, $35.00. All excellent condition. FOB Oakland, W6VPC, 1067 Mandana Blvd., Oakland 10, Calif.

FOR SALE: AN/FGC-1X TU complete, with some spares and manual $60.00. W6PZX, 1300 California Ave., Compton, Calif.

FOR SALE: Tuning forks 87.6 (60 WPM, 96.19 British speed), 180 VPS (60 WPM Kleinschmidt). Also a few 8, 32, and 64 Oz. spring adjusting scales. $1.50 each PP USA. Jim Dawson, K7HGD/6,824 Olmstead, San Francisco, Calif.

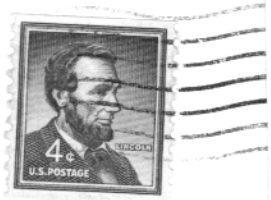
FOR SALE: Model 15s complete with tables, delivered DENVER, Waiver required $85.00. CATS, Walter Reed, W0WRO, Secty., 1355 East Amherst Circle, Denver, Colorado.

FOR SALE: Model 14 TD with base and sync motor, excellent condx. 60 WPM, $75.00. 88mhy toroids uncased like new, 60c each P.P. W. W. Chew, Jr., K2MKQ, 257 Washington Drive, Pennsville, N. J.

FOR SALE: Model 26, $65.00. Model 15 page printer, like new, $110.00. Model 19 ASR complete, $400.00. L4 receive only typing reperfs type FPR-5, $75.00. 14 typing reperfs with kybds., end of line, back space, holding magnets auto-tape feed, $180.00. 14 TDs, rebuilt, $90.00. All have std communications type and kybds., all refinfinished. Specify govnd or sync motor. No waiver reqd. W6YJG, 1123 Pine Street, Santa Monica, Calif.

WANTED: Instruction manual for Kleinschmidt Model TT-4/TG XC-3, Not TM 11-2234. Will refund postage. ZS1FD F. H. Flanter, 3 Shanklin Crescent, Camps Bay C. P., South Africa.

**RTTY, Inc.**
**372 WEST WARREN WAY**
**Arcadia, California**
Return Postage Guaranteed

# SECOND ANNUAL "WORLD-WIDE RTTY SWEEPSTAKES"

This is a competition between all stations throughout the world to determine their ability to exchange messages via two-way radio teleprinter.

SWEEPSTAKES RULES

1. Test period:
   0200 GMT Oct. 20th to 0200 GMT Oct. 22nd, 1962.
2. Bands:
   This test will be conducted in the 3.5, 7.0, 14.0, 21.0 and 28.0 MCS. Amateur Bands.
3. Stations may not be contacted more than once on any one band. Additional contacts may be made with the same station if a different band is used. In the interest of encouraging multi-band DX operation, the same country may be claimed more than once if contacted on different bands. The same state worked on more than one band may only be claimed once.
4. Country Status:
   For the purpose of this contest, KH6, KL7 and VO will be considered separate countries in additino to the ARRL country list.
5. Stations will exchange messages consisting of:
   (A) Message Number
   (B) Check (RST)
   (C) Time in GMT
   (D) State or foreign country
6. Points:
   (A) All two-way RTTY contacts by North and South American countries including KH6 will earn two points.
   (B) All two-way RTTY contacts by countries other than in (A) above will receive ten points.
   (C) All stations receive 200 points per country worked not including their own.
7. Scoring:

   INCLUDES ALL STATIONS

   (A) Two-way exchange points times total states worked.
   (B) Total country points per band times number of continents worked.
   (C) Add item (A) and (B) above. (This is your total test score.)
8. Sample score sheet:

| | | | | |
|---|---|---|---|---|
| (A) Exchange points | (196) | times states | (40) | equals (7,840) |
| (B) Country points | (800) | times continents | (3) | equals (2,400) |
| (C) Add (A) and (B) above | | | | (10,240) (Total Test Score) |

9. Sample Log:

W6TPJ — Station Log of ..... (Call) — 20, Oct. 1962 — Date .....

| | SENT | | | | | RECEIVED | | STATE OR COUNTRY | EXCHANGE POINTS |
|---|---|---|---|---|---|---|---|---|---|
| NR | RST | TIME | BAND | STATION | NR | RST | TIME | | |
| 1 | 589 | 0205 | 14 | W6CG | 2 | 589 | 0204 | California | 2 |
| 2 | 569 | 0230 | 14 | VK3KF | 6 | 579 | 0231 | Australia | 2 |
| 3 | ? | ? | 14 | W6NRM | 4 | 359 | 0240 | — | 0 |
| 4 | 599 | 0300 | 14 | W2JAV | 7 | 599 | 0259 | New Jersey | 2 |
| 5 | 579 | 0514 | 7 | VK3KF | 22 | 569 | 0514 | Australia | 2 |

Total Exchange Points (8) — States (2) — Countries (2) — Continents (2)

VK3KF — Station Log of ..... (Call) — 20, Oct. 1962 — Date .....

| | SENT | | | | | RECEIVED | | STATE OR COUNTRY | EXCHANGE POINTS |
|---|---|---|---|---|---|---|---|---|---|
| NR | RST | TIME | BAND | STATION | NR | RST | TIME | | |
| 1 | 599 | 0201 | 21 | ZL3HJ | 1 | 599 | 0202 | New Zealand | 10 |
| 2 | 589 | 0204 | 21 | W6CG | 1 | 569 | 0205 | California | 10 |
| 3 | 589 | 0210 | 21 | W6NRM | 3 | 569 | 0210 | — | 10 |
| 4 | 569 | 0220 | 14 | W6AEE | 2 | 569 | 0222 | — | 10 |
| 5 | 579 | 0224 | 14 | VE7KX | 9 | 589 | 0225 | Canada | 10 |

Total Exchange Points (50) — States (1) — Countries (3) — Continents (2)

NOTE:
Log the state only once the first time contacted. Log the country the first time contacted on each band. (See Sample Log Para. 9.)

10. Logs and score sheet should be received by RTTY, Inc., 372 West Warren Way, Arcadia, California by December 1, 1962 to qualify.



# GETTING STARTED ON RADIOTELETYPE

## PART III — SELECTING THE TRANSMITTER

**Irvin M. Hoff, K8DKC**
**1733 West Huron River Drive**
**Ann Arbor, Michigan**

According to the latest figures, there are something over 235,00 licensed amateur radio operators in the USA at present. Of this number perhaps only a couple of thousand at most have teletype equipment as yet. With these figures in mind, it is not too difficult to understand why no manufacturer has as yet made a commercial transmitter particularly for radio-teletype. We cannot, therefore, point to a single item and say, "this is it." However, there are various units available today which come close to what we might want if we were designing a unit with only RTTY in mind.

First let us mention the main items to look for:

(1) Stability
(2) Ease of adapting to frequency shift keying (FSK)
(3) Clean signal of perhaps 100-200 watts
(4) Cost
(5) Reliability
(6) Ease with which modifications may be made
(7) Incidental items such as size, weight, appearance, resale value, etc.

Actually there is no transmitter today that would score a perfect answer on all these items. There are several that come fairly close, but most of these are actually designed for voice communications, and are quite expensive if one is to consider only RTTY. Fortunately, most amateurs are quite broad in their interest and would prefer a multi-purpose unit. This, then, makes the choice more simple.

To mention an ideal transmitter for Teletype only, we should immediately rule out any requirements for either CW keying (we will key the FSK with narrow shift to prevent the other fellow's printer from running "wild"); or for any type of voice communications.

Now we have three parts of the transmitter to consider: The frequency-generating oscillator; the intermediate stages with final amplifier tube; and the power supply.

There are several good transmitter designs in the current ARRL handbook, including power supplies, so it should be enough to mention that a 12BY7 driver into a pair of commonly-used 6146's should be fine for the main part of the rf section. The power supply can be very straightforward, and similar to that in present use in any number of transmitters such as the DX-100, Viking II, etc.

The frequency-generating unit is one where we shall depart with current practice in usual AM-CW transmitter of which we just mentioned two good examples.

Almost every transmitter on the market today that was designed basically for AM uses a VFO — either built-in or plug in as an accessory. These normally have two basic output ranges — usually the first range is from about 1.6 megacycle to perhaps 2.0 mc. This is for the 160 meter band. This is then "doubled" for the 80 meter band, which by now only uses one-half the "band-width" on the indicator dial on the front panel.

On forty meters, the other range is usually 7.0-7.425 or so. This will hit the entire forty meter band (7.0-7.3). On this band good stability is achieved as the VFO runs "straight-through."

For twenty meters, the second harmonic is used, which would give 14.000 to 14.850. As you know the 20 meter band only extends up to 14.350, so a great deal of the VFO dial that was used for forty meters no longer can be used for 20m, thus "crowding" the dial into a fraction of the space.

On fifteen, the third harmonic is used, now giving three times the drift problem, and one-third the "band-spread". They continue to use this basic forty meter frequency even up to 10 meters, where the fourth harmonic is used, now getting 28.000 to 29.700. The frequency drift is now four times as bad.

This in an extended explanation, but is used because nearly all AM transmitters and CW transmitters use VFO's of this type.

Older Collins equipment was even "worse" in this respect. They generate all their bands from the 160 meter band and multiply each time, using only one basic frequency range. By the time you get up to even the twenty meter band, you are already on the eighth harmonic!

So our ideal unit would have a VFO of a different type — one that would correspond to the better and more stable types in use on single-sideband equipment today. These are called "heterodyning" oscillators, since one basic range is used, but it is mixed

with a crystal oscillator to give output that has the same "bandspread" on each band. With this type of unit the basic range is often 5.0 to 5.5 mc. Since the ten meter band is nearly two megacycle wide, this type of transmitter either offers only a portion of the ten meter band or else uses four different crystals on that band alone. As an example of how this works, we will use the twenty meter illustration. You could use a 9-mc crystal stage and mix (combine) the two to have outputs of the sum and difference — 9 mc plus 5.0 would be 14.000 and the difference would be 4.000 mc. This then would actually give both eighty and twenty, and in effect is the exact system in use today by Central Electronics in the famous series of 10-A, 20-A, etc.; and by Hallicrafters in the HT-37. With minor modifications it is the same type as used in the HT-32 series (HT-32A, HT-32B, etc.)

The problem with using the one 9-mc crystal is two-fold. First the dial would have to read backwards on one of the two bands (look at an HT-32A — twenty and eight are actually backwards) and secondly for RTTY, it would be necessary to use a reversing switch to keep the teleprinter operating correctly. This is simple enough to do, and is required for any Hallicrafters sideband transmitter, as well as many other makes. It is a minor disadvantage which we will "design around" in our ideal unit.

As a closing comment on our ideal unit, we will make a VFO which need not have a multi-scale dial, but be quite similar to the Collins "S"-line dial. A 100 kilocycle dial reading 0-100 would be quite suitable, particularly if linear so that each of the divisions would represent exactly one kilocycle. This unit should then be so accurate you would set your receiver from it, instead of the other way around!

Since we are discussing RTTY only and not cw or AM or SSB, etc. we would propose some enterprising manufacturer or interested amateur should build a simple heterodyning oscillator that would cover perhaps 5.000 to 5.100 mc. For the various bands, we would now have:

80 meters 3600-3700 with 8,700 Crystal
40 meters 7000-7100 with 12.100 Crystal
7100-7200 with 12.200 Crystal
20 m 14.000-14.100 with 19.100 Crystal*
15 m 21.000-21.100 with 27.100 Crystal*
10 m 29.000-29.100 with 34.100 Crystal*

Those with asterik would likely be third overtone crystals. For those who would have an interest in this project, we would suggest obtaining the Collins PTO from the "S"-line which would have a basic range of 0-200 on the dial, and the output of which would be 2.5-2.7 mc if used with the related 6U8A circuit.

With the system outlined, extreme stability even on ten meters would be possible; a "permanent" shift with no adjustment necessary for changing bands, and no reversing switch to bother with. This would be an expensive VFO, though, as it would have around $20-$30 worth of crystals alone. Of course, the cost would actually be small compared with comparable all-purpose transmitters using heteordyning oscillators. The Collins 32S-1 uses 15 crystals on covering just the ham-bands only, and you then only get 200 kc of the entire ten meter band! So stability is not a modest-cost item.

There is our "ideal" unit. Now we shall see what is available in commercial (new and used) equipment that might come fairly close to this model.

First of all we'll look at stability. This is by far the most important item, as you will soon discover if you are not already on RTTY. It is most annoying to buy or build an excellent converter which attempts to keep out interfering signals and then have a signal which drifts rapidly right out of the filter range. This requires the well-known "hand on the receiver" technique, which is quite irritating, especially if you have a small area for the ham shack and the receiver is not handy to the printer. A good "steady as a rock" signal is also important for the person who enjoys net operation, round-tables, etc. So we should plan on using the most stable unit that finances would allow.

This boils down at present to using SSB-type transmitters, mostly because they *must* be quite stable. Except for AM units which have been "adapted" for SSB, nearly all of these use a heterodyning system, which not only is normally very stable, but also has the same bandspread regardless of what band you are on, and very little back-lash, if any, in the dial system, which will become important as we eventually go to more narrow shifts to better utilize features inherent in RTTY.

So for stability, then, we should select items like the HT-32; Collins S-line; HT-37 and similar.

Many Viking II's are capable of putting out a moderately stable signal. Not necessarily one that won't vary for hours on end like some of the more expensive SSB transmitters, but stable enough for most purposes. It is thought the reason here is that the VFO for the Viking II is external where no great amounts of heat are generated. The VFO has its' own VR-tube to maintain a constant voltage on the tube. It has good temperature compensation. With such a unit, one could wire the filaments to always remain on, and good stability on 80 thru 20 should result. If extended operation on 15 and 10 were anticipated, we would suggest you consider a SSB unit with heterodyning oscillator.

The next item is ease of adapting FSK.



This is getting into the next article somewhat, which will discuss methods of using the transmitter to emit a signal of RTTY. However, there are some units much easier than others to use. Any of the SSB transmitters with heterodyning VFO's will give the same general shift no matter on which band you operate. (This is not precisely correct, insofar as when one changes the VFO setting, the shift value will change slightly: As an example, on the author's transmitter where "permanent"-type of shift is used which will be discussed in the next article, the following shifts are noted:

| | |
|---|---|
| 21.040<br>14.040 | 880 cps |
| 21.090<br>14.090 | 865 cps |
| 7135 | 785 cps |
| 3625 | 780 cps |

This is due to the VFO tuning dial varying the capacitance while the FSK system remains fixed.

With older AM type transmitters where we have shown that the same VFO basic requency is used for 10, 15, 20 and 40 meters, the shift must be changed radically each time, the band is changed. This often is quite inconvenient, and it is seldom that any but most technically-inclined can make this transition without sooner-or-later exceeding the legal 900 cps limit.

Therefore any AM-type transmitter presents certain difficulties for item 2, ease of FSK. Of course if you stick principally to one band, the problem becomes much less of a disadvantage.

It is also easily possible to have several small FSK units; one for each band — they only cost perhaps $1.50 or less each to build. You would then switch in a pre-set FSK unit in the transmitter.

Item 3 is achieved by nearly any of the modern AM or SSB transmitters, so no need to discuss this further.

Item four may be the big stumbling block, depending if you are "coming over to RTTY" from AM or from SSB. If from AM, you may want to invest in a transmitter which offers added stability and ease of FSK. If from SSB, you are no doubt fortunate in already having a unit that should work very well. We note that Hammarlund is now offering a brand-new item for SSB that perhaps will be quite good for RTTY — the HX-50 for $400.00. This seems from the advanced literature to be quite good.

Good used DX-100's, Viking II's, etc. could work very well as RTTY transmitters with a different VFO arrangement and should not be ruled out or overlooked. If one had no interest in SSB, he could probably buy a used DX-100 for perhaps $150 or so, and build a good VFO for around $50 including crystals for most bands. This would offer advantages over many much more expensive units.

Item 5. The more simple the unit, the more reliable. Actually most of the current AM and SSB units have had nearly all the "bugs" worked out by now, and should offer little trouble here. It would perhaps be unfair to point out one or two brands that have shown particular reliability as one who is not in the business would not have too broad a background to base such a decision upon. You will have your own preference here, no doubt.

Item 6. Some of the units such as the Johnson Pacemaker are atrocious to work on. They require long periods of time to merely open in order to change a tube. The DX-100 is nearly as bad, and the DX-100B has an entirely redesigned cabinet with easy access cover. However, Collins can take credit here for having units in the "S"-line that are very easy to "get at". The HT-32 series is quite convenient as long as you don't want to change something "inside". Nearly all of the older AM transmitters are built large and heavy. A majority of SSB transmitters are not easy to wrest around to get the cabinet off, as is frequently necessary when first going on RTTY — to add remote push-to-talk, etc. for station convenience. If you are not able to lift 50-75 pound items without trouble, you may either have to get a friend to do the work for you or consider a different item.

The 20-A is an oft-overlooked unit. The BC-458 VFO leaves much to be desired and would not be recommended particularly, but this transmitter in conjunction with the heterodyning VFO described could easily make a fine unit for driving larger transmitters. However, since one would have little interest in SSB (perhaps) the basic VFO could be used to merely drive an intermediate stage, itself. The 20-A is a modest-cost item, though, and quite easy to work on.

Item 7 has already been covered in part, and while these things are of some import in selecting a transmitter they fall into the personal opinion category and we will not discuss them further.

Now to summarize, we will pick two different systems for RTTY: (1) A used Viking II with our special VFO, or if cost is a real factor, the original Viking VFO, remembering that several FSK units can easily be installed to overcome some of the inherent disadvantages.

(2) A Hallicrafters HT-37. This unit has another advantage of having a simple Miller-type Crystal oscillator circuit in the 9-mc heteordyning system. A possibility exists that this circuit can be adapted for crystal shift itself, although at the moment most circuits of this nature have been rather unsatisfactory. More on this type of shifter in article 4.

If the HT-37 is to be used for RTTY, we would recommend the addition of a cooling fan similar to that used in the HT-32 series

Cont. Page 7

# Before the
# FEDERAL COMMUNICATIONS COMMISSION
# Washington 25, D. C.

## PETITION FOR RULE MAKING

In the Matter of

Amendment of Section 12.82 of the Commission's Rules to Modify Identification Requirements For Amateur Radio Teletype Stations — RM —

The American Radio Relay League, Incorporated, by its General Counsel, respectfully requests that Section 12.82 (a) (2) of the Commission's Rules and Regulations be amended so as to make it unnecessary for amateur radio teletype stations to transmit the call sign or signs of the station or stations being called or communicated with by telegraphy using the International Morse Code.

In support whereof, the following is respectfully submitted:

1. Section 12.82(a) (1) of the Commission's Rules requires amateur radio stations to transmit the call sign or signs of the station or stations being called or communicated with at the beginning and end of each transmission or series of transmissions, at least once every ten minutes or as soon thereafter as possible during a series of transmissions between stations having established communication, and at least once every ten minutes during any single transmission of more than ten minutes duration. Section 12.82 (a) (2) reads as follows:

> "(2). The required identification shall be transmitted on the frequency or frequencies being employed at the time and, in accordance with the type of emission authorized thereon, shall be by either telegraphy using the International Morse Code, or telephony. In addition to the foregoing, when a method of communication other than telephony telegraphy using the International Morse Code is being used or attempted, the prescribed identification shall also be transmitted by that method."

2. An amateur station conducting teletype transmissions now is required by Section 12.82 (a) (2) to transmit the call sign or signs of the station or stations being called or communicated with as well as its own call sign both by teletype and by telegraphy using the International Morse Code. The telegraphic identification requires the interruption of the teletype transmissions, either by hand or automatically. Because the station or stations being called or communicated with and their call signs usually vary with each series of transmissions, automatic means of transmitting the required telegraphic identification seldom may be used. The result is that the telegraphic identification usually must be made by hand, thereby nullifying many of the automatic aspects and benefits of teletype communications.

3. The League, by a petition for rule making filed on August 17, 1961 (RM-277), requested that Section 12.82 (a) (2) be amended to completely eliminate the requirement for telegraphic identification by amateur teletype stations. The Commission, by a memorandum opinion and order released February 26, 1962 (FCC 62-214; 22 RR 1573), denied the petition with the following explanation:

> "(4). The dual identificaiton requirement is necessary for the Commission properly to perform its duties. Amateur stations are not assigned specific frequencies, and as a consequence, the interference resulting from the overlapping of signals makes identification difficult at best. Infraction notices are issued only upon positive identification. Without the dual identification requirement, positive identification would be very difficult for the monitoring stations, and practically impossible for the Commission's mobile units which are not equipped to receive radioteletype transmissions. It appears to the Commission that the advantage to the Amateur service as a whole in having proper and prompt enforcement of the Amateur Rules and Regulations outweights any possible advantage to be gained from the relaxation of the present identification requirements."

4. It is respectfully submitted that the Commission's identification needs will be fully met by modifying the present dual identification requirement for teletype operation only to the extent of making it unnecessary for telegraphic transmission of the call sign or signs of the station or stations being called or communicated with by a station conducting teletype transmissions. The Commission's monitoring stations and mobile units, as well as the League's Official Observer, still will be able to identify the transmitting staiton by the telegraphic transmission of its own call sign. Should the Commission desire to learn the identity of the station or stations called or communicated with, it need only ask the transmitting station to supply the desired information from the logs it is required to maintain.

5. The benefits from the requested amendment will be most substantial to the Amateur Radio Service. A simple automatic keyer may be used to transmit the required telegraphic identification of the transmitting station each ten minutes.[1] Further improvements and refinements in teletype equipment, techniques and operating procedures will be possible. The all too scarce frequencies will be used more efficiently. More amateurs may be attracted to teletype operation. Thus, the Commission will further the advance of the Amateur Radio Service without making more difficult its monitoring duties and responsibilities.

6. The requested changes may be accomplished by amending the second sentence of Section 12.82 (a) (2) to read as follows:

> "In addition to the foregoing, when a method of communication other than telephony or telegraphy using the International Morse Code is being used or attempted, the prescribed identification shall be transmitted by the method of communication being used or attempted and the call sign of the transmitting station also shall be transmitted by telephony or telegraphy using the International Morse Code."

WHEREFORE, the premises considered, it is respectfully resquested that the Commission institute a rule making proceeding to amend Section 12.82 (a) (2) as set forth herein.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED

By /s/ Robert M. Booth, Jr.
Robert M. Booth, Jr.
Its General Counsel

1735 DeSales Street, N.W.
Washington 6, D.C.

August 24, 1962

[1] A suggestion has been received by the League that telegraphic identification of the transmitting station might be superimposed upon the carrier without interrupting the teletype transmissions. It is suggested that any notice of proposed rule making based upon this petition invite comments and suggestions on such a method of telegraphic identification.



for cooling the 6146 area. This would allow for longer life of the tubes, but offer the added advantage of drawing off warm air which would otherwise cause slow drift of the VFO with extended operation.

In any transmitter, frequency stability can often be improved, although the newer SSB transmitters usually need no further attention. Voltage regulation could be checked or added; the filaments could be run from a DC regulated source on the VFO; the filaments could run on the VFO only, continuously; better temperature compensation is usually possible and sometimes called for; heat can be removed from the VFO area by the use of heat-shielded tubes; vents; small fans; etc.; the VFO can be removed from any area where heat would be generated in large amounts like the final stage, power supply, etc.; and of course some attention could easily be given to running a special heavy duty line cable to the transmitter to minimize any voltage variation in the house current. Any or all of these will vastly improve older transmitters, and many of them take very little if any expenditure of money.

The Halicrafters Company has expressed an interest in building a transmitter for sole use on RTTY. If interested in such an item, why don't you write to them and state your interest. Even though there would perhaps be no vast market for a transmitter which did not offer voice, it would be wonderful for a manufacturer to take such an interest.

While thinking about Hallicrafters, they are at present putting a VFO (the HA-5) on the market which is a little like the one we discussed. However, it uses the same crystal for 40, 20, 15 and 10, thus hardly making it worth the fairly expensive price tag of nearly $80 without some modification. W6NRM is at present studying such a unit and will comment on it later in the year, no doubt. It could be a very nice unit with several proposed changes, none of which appear at this time to be difficult to accomplish. If the price tag is within your means, this is as close as anything on the market for "salvaging" older AM transmitters. With the simple changes in the switch section under consideration, this would offer (in combination with a DX-100 or Viking II) an excellent combination for a price of less than half the most commonly used SSB transmitters such as the HT-32, 32S-1, etc.

Companies like WRL, Johnson, Heath, Eico, Knight, Hallicrafters, Gonset, and others offer separate VFO units. Perhaps one of these days, one of them will bring out a unit such as we have described.

In conclusion, if the present experiments under way regarding FSK of a crystal should somehow prove to be satisfactory, this would open up a quite modest-cost and extremely stable method of frequency control.

# KNOWING YOUR SELECTOR MECHANISMS

**Dave Hinkley, W1PBS**
**Box 364, Barre, Mass.**

After repairing quite a few machines and helping some fellows get their rigs going, I have found that not too many know the basic difference between the types of selectors their machines have or how to tell them apart. There has been a few fine articles on their operation, so I will not go into that.

There are only two we are interested in (forget the Model 12) now. They are known as single magnet selectors (I know there is two coils on them). That is they operate the same magnet for all pulses. Fig. 1 shows the pulling magnet selector. This one is wired in series aiding always. The most important single thing about it is that it has to be operated at not less than 60 mils. or it will not function right. The Telephone Co. (TWX) uses 62.5 mils. instead of 60, the Western Union uses 70 mils. Both do OK. In this selector, the armature is free on its Pivots with no current applied. The current does all the work to pull the armature to its pole pieces. Therefore we get the name pulling mag. You can see why this higher current is necessary and that the armature has to be free if it is going to follow the 22 milsec signals. Another thing you will find is that they tend to orient to the low or marking side of the range arm, say from 10 to 90 with a zero bias fox signal sent to it.

The pulling magnet is a very good selector and if treated right will be as good as any. It is old but still good. Changing to the newer one is expensive and not necessary in most cases.

The holding magnet, shown on Fig. 2, is an improvement on the older one, in that it is a two current magnet (also two coils). The machines are setup with a switch or a terminal block in the back of the upper track on a 15. This switch is the series parallel control. In parallel the machine is setup for 60 mil. operation. In series it is setup for 20 mil. operation. In the series hookup, there is also a 5K resistor in series with the loop. This is the only selector in the series connection that will operate on 20 mils. and here is the reason why, on Figure 2, note the armature cam and armature lever. The lever is shown in the low part of the cam so the armature is in its unoperated position, as the cam turns in a clockwise direction, the lever raises up to the high part and causes the armature to operate. If this is a marking pulse, the current will then hold it there as the cam drops it therefore we get the name holding magnet. If this is a spacing pulse, the lever will follow the cam and drop off until the next high spot of the cam. All the armature operations are mechanical in this type of selector so the current is not so important as it does not have to pull, just hold. These selectors will tend to orient to the high side of the range arm, perhaps from 30 to 110 with a zero bias "Fox" signal.

If you have a Model 15, the chances are you will get a pulling magnet on it. If a 14 reperf, its about 50 percent chance of a pulling magnet, but if a 26, they were all made with the holding type. In many of the TU that have been developed, they give you two types of output ckts, one tube for 20 mils and two tubes for 60 or for a relay hookup. In a setup like this you will have to make the necessary arrangements to provide the proper current for your selector. Don't be fooled by a good local copy if you get it to work without the proper current because you will find that the on-the-air copy will be poor and everybody but you will be sending bad signals.

Always use 60 mils whenever possible, no matter which selector you have. On my own station, I have all holding magnets and I always use 60 mils and the result is good. It is best if you can keep the DC voltage up to around 100 VDC at least on the sending contacts, this helps to keep the keyboard contacts carbon free.



Fig. 1

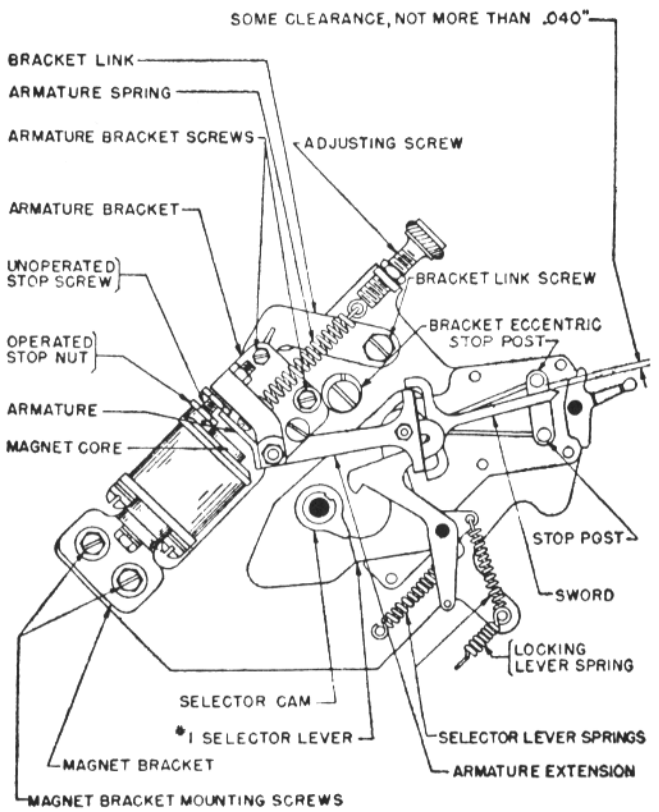
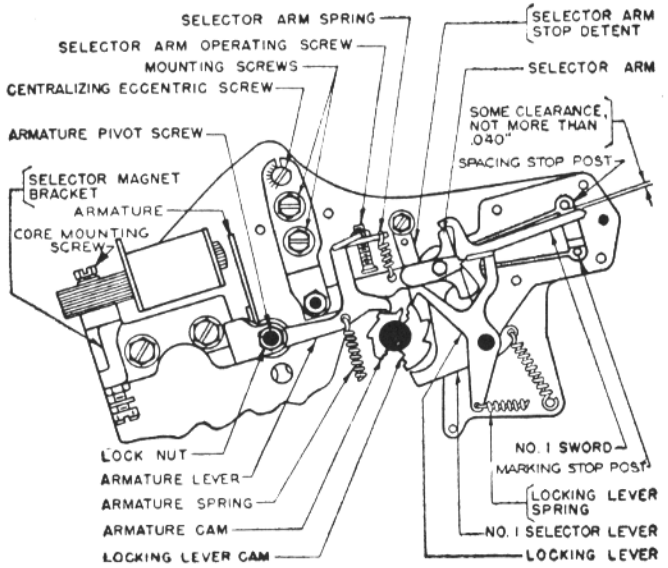



Fig. 2



# RTTY AT THE ARRL NATIONAL CONVENTION IN PORTLAND, OREGON

On September 1, 2, and 3, 1962 — over the Labor Day weekend an ARRL National Convention was held in the 8 million dollar Coliseum at Portland, Oregon. About 2,000 people attended, mostly from the W7 area with quite a few from down South — as far as San Francisco and Los Angeles areas.The weather at the Rose City was perfectly delightful, with bright sunshine being the order of the day. The building itself is perfectly marvelous — essentially a boxlike enclosure with enormous glass panes around the four sides with a covered roof. Inside is a stadium with accommodation for upwards to 5,000 seats with an arena area suitable for such activities as basketball, ice hockey, or ice follies. And there are associated rooms which make the whole Coliseum a first-rate sports and convention center in the Portland area.

Merrill Swan, W6AEE, and R. H. Weitbrecht, W6NRM, were requested to present a talk and an exhibit concerning RTTY matters during the Convention. Arrangements were made, through the kindness of R. Wright, W7IE and Thurlow Wauchope, W7LI, to provide suitable space and equipment to enable an actual on-the-air amateur RTTY installation. W6NRM brought along his Drake 2B receiver and Mark IV-2 Terminal Unit, plus some fittings to make connections to several machines and to a transmitter. And furthermore the trustees of the U.S. Navy amateur radio station K7USN put, much to our pleasure, their antenna and equipment at our disposal. If it were not for that antenna — a trap doublet tuneable for 80-40-20-15 meters — it would have been considerably more difficult for us to put on an effective crowd-gathering radioteletype display — showing actual communications with RTTY amateurs around the country, as well as printing some press transmissions from commercials in the 14.5-15 mc spectrum.

The transmitter problem was solved by a raiding expedition led by W6NRM and cohorts upon the Hallicrafters exhibit in the manufacturers' display room. Actually Bud Drobish, the Hallicrafters' representative, was very gladly cooperative and allowed us to borrow a brand new HT-32B exciter for use at the W6NRM/7 RTTY setup. Bud helped with the details of transmitter and antenna relay switching, while Bob W6NRM installed an already-prepared germanium diode FSK adapter into the exciter's VFO. The FSK circuit is driven directly by the Mark IV-2 Terminal Unit — using the very same Teleprinter Loop system as in the Mark III (Jan./Feb. 1961 RTTY). We were much pleased to find that the HT-32B transmitter worked right off the proverbial bat, and it provided a superb FSK signal that brought in excellent reports from stations back East on 20 meters.

Needless to say, the RTTY exhibit worked right along fine from the very start. A sizable number of contacts were made on 7140 and 14090 kc with such stations as W6LDF, K8DKC, K7DSR, W7IE (when Bob ran home from the Convention on various errands), and several other stations. Contacts like these were made on and off during the three days, with other times spent copying press transmissions from commercials as well as "just copying ham RTTY." The crowds were treated to sights such as RTTY copying of pictures of President Kennedy and former President Eisenhower, as well as typical "RTTY QSL Cards". Of course we allowed the Navy to operate their exhibit station — they were indeed gracious to lend us their antenna now and then!

Two machines were used during the RTTY operations. A Model 15 and a Model 26, both machines connected in series and fed by the Mark IV's Teleprinter Loop, were arranged so one was made available for gawking at by the crowd and other was right at the operating position. And of course the Model 26 had its usual superfine keyboard — a dream to operate in comparison to that of the fifteen. Thanks, W7LI!

At the RTTY Breakfast, approximately 200 people attended to hear Merrill, W6AEE, give a talk on the history of amateur RTTY and on various Terminal Unit design considerations, with particular emphasis on the Mark IV which was put on display. Mark IV diagrams were distributed, along with supplementary sketches showing the partial conduction FSK diode circuits as usable with HT-32 and HA-5 transmitter equipment. Before we realized, the too-few copies were all gone! It is to be hoped that the W7 gang will share the information amongst themselves for the time being.

All in all, a thoroughly successful RTTY display, and a thoroughly successful ARRL Convention. A wonderful time was had, and opportunities were afforded to renew acquaintances with such fine people as Harold Wade, W7HRC, Mrs. Wade, the W7 gang as mentioned above, W7RZY, VE7AIK, W7PRG, W7QYF, and many others. Incidentally, W7QYF, from Klamath Falls, is an old old timer of 52 years in radio! And of course the QCWA Breakfast was in itself a whole story. The exhibits were their usual fine standard, too. So many things to see during the Convention, one feels unable to mention everything. And, judging by the RTTY exhibit's attraction for the Convention people, we feel it was a most worthwhile effort, and one that should be expanded considerably and made a part of every Amateur Radio Convention everywhere. It only takes little effort to put on an effective display of that sort, and the benefits are obvious as so many of the Hams know so little about Amateur RTTY. And they should be given opportunities to see actual radioteletype equipment in operating condition for actual one-the-air communications with RTTY Hams all around the country. Low frequency RTTY is extremely effective, as far many more stations are available for contacts than on VHF.

We wish to thank all the people concerned for the aid they have given us in realizing an effective RTTY display. We are indeed grateful to the U.S. Navy, the Hallicrafters Company, as well as to W7IE and W7LI with their Convention associates.

73 de W6AEE/W6NRM




# MILITARY AFFILIATE RADIO SYSTEM, NAVY STYLE

**By LCDR. C. R. WINNETTE, USNR—Director, Navy MARS and Head, Naval Reserve and Amateur Radio Liaison Branch, Office of Naval Communications**

**From: MR. CHARLES T. GARLAND, Head, Technical Information Branch, Office of Naval Communications (Op-945Y), Navy Department, Washington 25, D.C.**

In November 1948, the Secretaries of the Army and Air Force established a MILITARY AMATEUR RADIO SYSTEM for their respective services by a joint directive. The name was changed to the present Military Affiliate Radio System (MARS) in September 1952. The Navy had started its postwar Volunteer Reserves in 1946 and, therefore, did not subscribe to the new MARS program.

Since neither the Army or Navy could return to their prewar Army Amateur Radio System (AARS) and Naval Communications Reserve (NCR) operations in the amateur radio bands, these two new programs were established as military circuits using frequencies as assigned by their respective services. The Navy's Volunteer Reserves went through many changes and evolved as the present organizations of the Intra and Inter Naval District Reserve Networks. These Naval Reserve circuits grew further and further away from the amateur radio operations, and while Naval Reservists were, and are, encouraged to participate in amateur radio activities, there is no requirement for their holding an amateur ticket. The Naval Reserve Networks are designed and operated to train obligated personnel to fill specific mobilization assignments. Participants of the Reserve circuits are Naval Reservists first and may or may not be amateurs.

During the past few years there has been a growing group of Navy and ex-Navy communicators who have advocated a Navy MARS as a tangible program for the large group of Navy trained communications personnel and Navy oriented HAMS. Heretofore, there was no Navy sponsored program by which the Regular and Retired personnel, as well as the young amateurs, could maintain a close relationship with Naval Communications through his amateur license. The possibility for an auxiliary network that could provide an unparalleled capability for the survivability of a Naval Communication System during periods of local, national, or inter-national emergencies, plus the chance to create a potential input of personnel into the Naval Communication System while providing a means for the HAMS with salt water in their system to maintain their Navy proficiencies led the DNC, CNO, and SECNAV to the conclusion that the time was ripe for a Navy MARS. Therefore, on 17 August 1962 the Secretary of the Navy approved a CNO request for authority to establish a Navy MARS. This decision was announced to the amateur world by Rear Admiral Bernard F. Roeder, the Director, Naval Communications during his speech before the Twelfth Annual National American Radio Relay League Convention in Portland, Oregon, on 3 September 1962.

The target date for the implementation of the MARS program is 1 January 1963. At that time the MARS headquarters station NAV/K4NAA will commence operating from the old NAA Navy Radio, Arlington site. This site is presently occupied by the National Naval Reserve Master Control Radio Station (NCR).

The Navy MARS will be an adjunct to the established Naval and Naval Reserve Communications Systems. Its operation and administration will be conducted on a parallel but separate basis from the existing Navy systems. No reduction in the present operational training of the Naval Reserve is anticipated. These two programs should augment each other and result in mutual benefits to each.

Participants in a Navy MARS will be amateurs first and may or may not choose to affiliate with one of the Naval Reserve programs. Membership in the Navy MARS program will be open to any amateur operator, club station, or military recreation station that holds a valid amateur radio license issued by an authorized agency of the United States Government and that can qualify under the eligibility rules as established by the Director of Naval Communications. Complete details on eligibility and procedures for membership application will be promulgated by an OPNAV Instruction. Those ships specific authority issued by the Chief of operating as a maritime mobile station under Naval Operations may also apply for membership.

The Navy MARS will be an extension of the long standing Navy Department policy of encouragement and support of amateur radio activity among the Regular, Reserve, and Retired personnel of the U.S. Navy, Marine Corps, and Coast Guard.

The existing Army and Air Force MARS determines major policy by joint action, but their operations are conducted separately by the respective services. The Navy MARS will subscribe to this concept and will maintain close liaison with the other programs.

Army and Air Force MARS programs make use of the amateur's call in their assignment of a MARS call sign. This procedure cannot apply for the Navy MARS since the simple substitution of an N, NA, or NB for the W, K, WN, etc. of the amateur call would create conflicts with Naval Reserve call signs already assigned. Therefore, the Navy MARS call signs will have to be assigned from a special block of NØ calls which have been assigned for this purpose. The call signs available are NØRAA through NØZZZ. In order to assure optimum use of the calls allocated and to provide a means for returning unused blocks, the call signs will be assigned by the Director, Navy MARS.

The program will be organized along the Regular Navy type of command structure. The Director, Navy MARS will be an additional duty for the Head, Naval Reserve and Amateur Radio Liaison Branch of the Office of Naval Communications. Field area chiefs will be full time active duty personnel assigned to the Naval District Headquarters for military jurisdiction, but under the management control of the Director, Naval Communications. The Field Area Chiefs will organize volunteer state, district, or section chief as warranted by the membership in each specific location. The volunteer chiefs will organize Net Control Stations. Each Network will consist of approximately ten members. Network operations will involve daytime and nighttime circuits as necessary to accommodate the preferences of the local members.

The Navy is proud to announce this progressive program which should provide a closer relationship and mutual benefits to the unincorporated partnership between the amateurs and the Navy.

At this stage, the details of manual writing, instructions preparation, frequency problems, and coordination necessary to effectively implement this program are being confronted. Further information will be released as soon as it is available. In the meantime, comments and suggestions from any of the 244,000 licensed amateurs in the United States and from Naval Communicators everywhere, are invited.



## CHICAGO AREA TELEPRINTER SOCIETY

The officers of the CATS invite you to attend the eighth annual "CHI-RTTY" meeting on 7 October, 1962. The meeting is held on the Sunday preceeding the National Electronics Conference to allow those who are attending the Conference to also attend the meeting.

The meeting will be held this year at McCormick Place, 23rd Street and Lake Shore Drive. The room will be open from 1000 for registration, rag chewing and informal equipment demonstration. The technical session will begin at 1400 and run until 1700. As usual, there will be no registration or other fees for attendance at the meeting. The only expense will be for each individual's own food and refreshments. The usual evening dinner meeting will be held at a nearby restaurant. Price of this dinner will be $4.50 and advance reservations are requested. Send reservations and checks to:

Ray Morrison, W9GRW
8029 Keeler Avenue
Skokie, Illinois

The main attendance prize, to be awarded to one of those attending the dinner, is a MODEL 28 printer. Attendance at the dinner is necessary to be eligible for this prize. Numerous other prizes will be awarded at the conclusion of the afternoon technical session.

Anyone interested in presenting a short paper on a subject of interest to amateur RTTY'ERS is invited to submit the title of their paper for inclusion in the meeting program.

George, W9SPT
Ray, W9GRW

## ANNOUNCEMENT . . .

W6NRM is now transmitting Pacific Division Bulletins on 3610 kc RTTY on the Second and Fourth Wednesdays of each month, at 8 P.M. Local Time (PDT or PST as the case may be announced by the State). Copy will be run twice to assure solid reception at all receivers concerned. No standby periods after transmissions contemplated.

Sept. 11, 1962 R. Weitbrecht, W6NRM

# DX-RTTY

**Bud Schultz, W6CG**
**5226 N. Willmonte Ave.**
**Temple City, Calif.**

Hi DX'ers:

With everyone tooling up for the big DX Jamboree this month I'll try to keep this one short so you can all get back to work on those CQ tapes, etc. The reports from overseas are continuing to come in from all parts of the World and it appears that with a recent break in propagation conditions the upcoming contest should be a real record breaker. Reports show that activity in Central and South America as well as in Mexico is really picking up. Bob, W6NRM came up with a new one when he made the first contact with CE3XA in Santiago. PY2BCD was logged while in contact with K4PJJ for his first QSO with the States. PY2BCD runs a Johnson KW in addition to an "S" line setup. He uses a TMC converter and lots of Olivetti teleprinter gear. My spies tell me that PY22BCD comes in like gangbusters so keep your ears open for him if you need Brazil. His QTH is Rua Guatemala 193, Jardim America, Sao Paulo. K8DKC tells me that Bob, TG9AD has returned from his visit to Colorado and is once again tearing things up on the baud frequencies. Bob should be one of the ones to watch in the Contest this month! From South of the Border two new ones this month in the calls XE1YJ and XE1DE. Both were operating near 14,090 Kcs with fine FSK signals. They will be welcome additions to the growing XE list which is headed up by our old friend, XE1BI. Johnny Ortiz, KP4GN, is keeping things jumping down Puerto Rico way. His signals are always pegging the meter here on the West Coast. Nothing to report on the two "Franks"—OA4BN and YV1EM but it's a good bet that they will be on hand for the Contest.

Irv, K8DKC reports that he had a chat with DLØEK on 14,110 Kcs. This again reminds me to remind you to listen for the DL stations above 14,100. Be sure and check the band up to 14,125 during the SS – it may pay dividends. K3GIF worked DL4BV for a new one. Ed tells me that DL4BV has a mess of machines borrowed from MARS in West Germany and anyone needing parts for 14's and 15's in Germany should contact him. DL4BV was putting in a solid S9 sig but could not attract any other Statesiders although the band was full of RTTY stations. Word comes from Bruno, I1RIF, that next year he will take some TTY gear and operate from Sardinia! Another new European reported here by several is SVØWX. Henry, ZS1FD, sends word that he printed G3KZI loud and clear on twenty but could not raise him. Bill, ZS6UR, says to scratch the info on the MP4 station because he has word that this one is a phony! W4HME/MM has worked three South Africans, LA6J, I1RIF and other Europeans. Nice work!! W4HME/MM is the U.S.S. Independence. Speaking of Maritime operations; K8DKC has made over 100 contacts with W9AC/OA. W9AC/OA is the S.S. Hope now stationed in Peru. ET2US is temporarily off the air due to loss of his converter. Frank, W3PYW, has an extra T.U. and hopes to get it to ET2US shortly. Thanks a million, Frank!!

Arthur, G2FUD, airmailed a lot of good bits of news concerning current activity in the UK, including a report on G3CQE's visit to Cheshire. Arthur also included a run-down on the fine work that Piet, PAØYZ, is doing for RTTY over the VERON Club station, PAØAA. This might be a good time to remind all the European typers that they can send their Contest logs to Bill, G3CQE, for forwarding to the committee for scoring purposes. The chief editor received a msg from Jim, K6SEX, who is on jaunt through Ireland. He describes his visit to such places as Dublin, Killarney, Shannon, etc. Among the hams showing him around were EI4B, EI6W and EI3B. Jim says that RTTY gear is really needed over there and so far the source is negative. No doubt Jim planted some RTTY germs among the Irish lads. – Speaking of Ireland reminds me of the color "green" which brings to mind a query from Bruno, I1RIF, who wants to know why I continually refer to "the green keys" and the "green key fraternity", etc. – Well, how was I supposed to know that all those European Keyboards have blàck keys? Sorry, Bruno, I'll be more careful in the future.

The SPRATS gang from the South Pacific are coming on strong again now that their conditions are improving to the States. Heard Bill, ZK1BS, trying to wiggle out of a pile-up of RTTY'ers the other evening on 14,090. That's a sure sign that things are getting back to normal. Each week-end finds the "big three" – namely VK3KF, ZL1WB and ZL3HJ available from about 050 until the band folds up.

Eric has been managing to work VK2EG by reducing the speed on his 15 printer to match the speed of the 60 cps sync motor that Bill is using on the 50 cps mains. Thanks to the fine response to our urgent pleas for a brush motor for VK2EG's model 26 it should not be too long before he will be in good shape. Bruce, ZL1WB, is having trouble with line surges from a new substation they installed in his town. Keeps him busy replacing tubes in his gear. He also points out that the feller who takes care of the street lamps is complaining so ole Bruce has plenty of company. Might be a good time to open up a TV and Radio repair shop, Bruce. Am still receiving queries concerning contacts in Asia for WAC purposes. The only activity in Asia that I can report on is from Okinawa. Henry, ZS1FD, recently worked KR6AR, and KR6GF has been very consistent on 14 Mcs for the past month. Have had no word from Cole, KR6MF, for some time but am expecting him to show during the DX spree this month.

That's it for now, Gang – see you next month at the same old stand. Cheers and 73.

Bud W6CG

**Subscription Rate $3.00 Per Year**
RTTY is the Official Publication
of the
**RTTY Society of Southern California**
**and is published for the benefit of all RTTY Amateurs and Experimenters**

For "RTTY" Information:
W6DEO W6CG W6TPJ W6AEE

## HORSE TRADES

**FOR SALE:** 500 mhy toroids, adjustable, $2.50 each. Stuart Bartfield, W0IGU, 6150 Delmar, St. Louis 12, Mo.

**FOR SALE:** Collins 75-S-1 receiver with RTTY filter and crystal. All latest modifications, new condx, $325.00 FOB, W0SYN, 2135 Oxnard Blvd., N. Oxnard, California.



**TRADE:** Northern Radio AFSK tone generator for N.R. AFSK Tone converter, have schematic and 2125/2975 filters. Will exchange so that two of us would have complete packages. W6RCR, 5939 Almaden Lane, Oakland 11, California.

**FOR SALE:** Complete RTTY-setup only. Model 15 printer with auto-FR/CR, Model 14 typing reperf, 14 TD, CV-89, TU. RA-87 pwr supply, two loop switching consolette, BC-221VFO FSK 2 watt exciter, 2 to 8.0 mcs. Machines have all features. WA6AVJ, 4135 Jackson Street, Arlington, California.

**FOR SALE:** AN/URA-6 Frequency shift converter group will sell or trade for SSB exciter or Vidicon camera tubes. W2UFU, R. Spera, 37-10 33rd Street, Long Island City, N. Y.

**WANTED:** Model 26, inoperative but with most of the pieces. Wanted for spare parts. W4CXY, 361 East Drive, Oak Ridge, Tenn.

**FOR SALE:** Very good FRA TU for 455 Kcs IF, with manual. Will ship. W8KPT, 2637 McVey Blvd., WEST, Worthington, Ohio.

**SWAP:** Model 14 TD and slip base, series gonvd motor, brand new. Want ARMY Super Pro, grandaddy HRO or other old but usable communications receiver. A. T. Pickering, Sewanee, Tenn.

**FOR SALE:** 05-B/FR FSK exciter, good condx, need BC 1031 Panadapter or TDO Xmtr for cash. W3LST, 228 Plummer Street, Oil City, Pa.

**FOR SALE:** W2PAT model TU, professionally built and used very little. Magic eye tuning built in. $36.00. Dr. C. R. Crosby, W1QP, R.F.D., Chatham, Mass.

**FOR SALE:** FRA Converter, $35.00. W6CQO, 309 Palomares, Ventura, Calif.

**WANTED:** T 801 power transformer for CV-57/URR. Johnny Ortiz, KP4GN. P. O. Box 532, Guayama, Puerto Rico.

**FOR SALE:** Model 26 with table and FRA TU, $65.00. Hal Darata, 1030 Byram Street, Los Angeles 15, California.

**FOR SALE:** 14 typing reperf with typing base (kybd) and cover with sync motor, 60 WPM gears in good working condx. $80.00. Also same as above, BUT receiving only (no kybd), $65.00 sent COD. Have model 28 typing reperfs with bases including 60, 75, and 100 wpm gear shift. Sell or trade for 28 perf motor, or 28TD. Have several repairable 15 page printers parts or rebuilding. Also two 28 page printers without type, for parts or rebuilding. K5BQA, 10756 Wyatt Circle, Dallas 18, Texas.