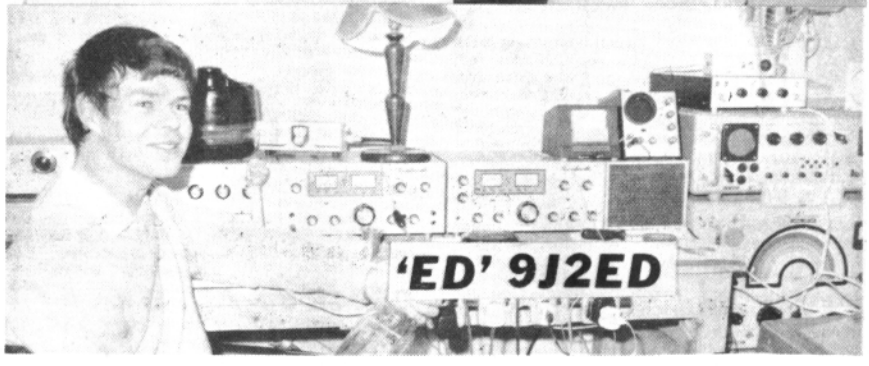
'FRANK' 9Y4VU



'ED' 9J2ED

Address Correction Requested
RTTY JOURNAL
P O Box 837
Royal Oak, Mich. 48068

FIRST CLASS MAIL
VIA AIR MAIL

RTTY JOURNAL

FEBRUARY 1972

EXCLUSIVELY AMATEUR RADIO TELETYPE

VOLUME 20 No 2 30 Cents

3 Stations Top Million Points in CARTG DX Contest-

See page 2 for details- results

*****

'Ben' W6GY

CONTENTS

RESULTS- CARTG DX SWEEPSTAKES- 1971

International RTTY is growing. The howling success (narrow shift howling) of the 11th CARTG DX Sweepstakes proves it. With the same scoring as before three stations went over a million points including one from the states. We also notice a number of high scores from the western states proving that the iron curtain of the east coast is no barrier.

Too much credit cannot be given to the CARTG organization, the British Columbia group and especially to Gwen Burnett, VE3YL who must be a marvel of efficiency and hard work to have all the logs checked and the results available in such a short time. Congratulations on a wonderful job. A summary and results are published below. Anyone wishing a detailed report can receive it from CARTG-85 Fifeshire Rd. Willowdale, Ontario, Canada. Include several IRCs for postage.

SWEEPSTAKES SUMMARY

Propagation reports for the 11th RTTY DX "British Columbia Centennial" Sweepstakes, October 16 - 18th, 1971 were varied from different parts of the globe, but the general consensus was "Good Propagation". QRM was at a minimum under contest circumstances, due no doubt to the almost exclusive use of Narrow Shift, and there was no dearth of exotic calls on the band. It was no problem to add new stations to the average list, and there were three scores claiming over one million points.

Only two Logs received were using exclusive 850 shift, and 95% of all contacts were made on 170 cps. -- that shows the way the RTTY trend is going. Over half the Logs showed activity on 10 meters, and 37 stations achieved WAC. This is an increase over last year, probably due to more African and Japanese stations providing the Asian continent. We missed India this year, but 4X4MR Israel and 9Y4VU Trinidad were both newcomers to our Contest.

On cross-checking many calls were noted but of these 117 Logs were sent in -- 97 single-operated and 10 multi-operated, 4 SWL Printer and 6 for record purposes only.

The twenty plaque and medallion awards are now being engraved with the calls of the winners, and will be sent out before the end of January. The Certificates will follow in a short time. Complete Contest Statistics can be obtained by sending an IRC to cover cost of postage.

C.A.R.T.G.

CONTEST AWARDS

THE 11TH RTTY DX "BRITISH COLUMBIA CENTENNIAL" SWEEPSTAKES

Single-Operated Stations

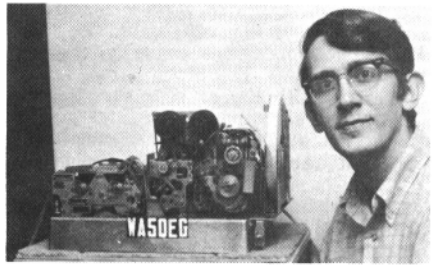
1. I1KG, Italy, 1,595,370, Plaque, British Columbia Amateur Radio Assn.
2. W3KV, U.S.A., 1,188,996, Plaque, "RTTY JOURNAL".
3. I6CGE, Italy, 1,000,044, Plaque, British Columbia A.R.A.
4. W4YG, U.S.A., 966,652, Plaque, "RTTY JOURNAL".
5. I5MPK, Italy, 955,440, Plaque, British Columbia A.R.A.
6. I1CAQ, Italy, 918,994, Plaque, British Columbia A.R.A.
7. YV5AS, Venezuela, 865,000, Plaque, "RTTY JOURNAL".
8. WA2YVK, U.S.A., 790,436, Plaque, British Columbia A.R.A.
9. WA3KEG, U.S.A., 785,390, Plaque, British Columbia A.R.A.
10. ON4BX, Belgium, 778,450, Plaque, "RTTY JOURNAL".
11. W3KV, U.S.A., 1,188,996, Gold Medallion & Ribbon, "RTTY JOURNAL", High Score, U.S.A.
12. VE7UBC, Canada, 605,100, Gold Medallion & Ribbon, Canadian Director's ARRL Award, High Score Canada.
13. 9Q5BG, Congo, 605,110, Plaque, British Columbia A.R.A., High Score for "Green RTTYer"
14. I1KG, Italy, 17,380, Silver Medallion & Ribbon, "RTTY JOURNAL", High Score 10 Meters.
15. I5CLC, Italy, 721,246, Plaque, British Columbia A.R.A., Low Power (under 100 w.)
16. Paul Menadier, U.S.A., 455,468, Plaque, British Columbia A.R.A., High Score SWL Printer.
17. W3KV, U.S.A., 1,170,564, Plaque, Sidney Burnett Memorial Award, High Score Narrow Shift.

Multi-Operated Stations

1. VE2LO/W6, U.S.A., 709,370, Plaque, British Columbia A.R.A.
2. DL8VX, Germany, 691,862, Plaque, "RTTY JOURNAL".
3. HA5KBF, Hungary, 372,416, Plaque, British Columbia A.R.A.

COMPLETE SCORES ON PAGE 9

USING The 28 RT SET- -



TIM SWARTHOUT, WA5QEG
2106 Truman St.
BRYAN, TEXAS 77801

With the new multi-speed provision for amateur RTTY, the Model 28 Reperforator-Transmitter or "RT" Set should become quite popular. This is the Model 28 version of the older FRXD. Most 28 RT sets come equipped with three speed gear shifts on both the reperf and the T-D - allowing down speed conversion as well as up speed conversion. Down conversion cannot be done with the "simpler" electronic speed converters, as there is no provision made for storage. Converting from 100 WPM down to 60 WPM, for example, requires storage provision for four characters every second. To operate under these conditions for any length of time requires a tremendous amount of storage. Giant shift registers (available in MOS ICs) or large magnetic core memories could provide storage, but the electronics becomes a nightmare for the average amateur. In the RT set, the paper tape is the storage medium. At ten characters per inch, you can store quite a message in a few feet of paper tape.

Since most 28 RT sets come equipped with the 28 LPR typing reperf with the single magnet selector mechanism, which is a simple two wire connection into the loop, the bulk of this article will describe the connections for the LAXD "creep-head" T-D.

In talking with several amateur RTTY suppliers, it appears that most amateurs prefer the simpler single contact LXD T-D to the Model 28 multi-contact T-Ds. This is probably due to the apparent complexity of the multi-contact units. The Model 14 T-D is a multi-contact T-D, the main difference being that all of the connections between the transmitter (or sensing head) and the distributor were made at the factory.

Hooking up the LAXD is simply a matter of connecting the transmitter output (parallel output) to the distributor input (parallel input), taking the serial output from the distributor, and connecting the control circuitry. The circuit diagram shows a "deluxe" arrangement as far as the control circuit goes, and this can be simplified if you wish.

The latching relay circuit shown is required if you want the T-D to shut off if it should ever run out of tape completely. You can mount the start and stop buttons conveniently at the operating position and remote locate the rest of the noise generating machinery! For K-1, I used an Allied T154CC-CC which has four sets of contacts. One of the extra sets can operate a light to tell you when the T-D is operating. Another light can be operated by the low tape switch in the reperf tape supply reel so you know when you are about to run out of tape.

It is important to observe that the transmitter auxiliary contacts are in series with the distributor release coil. These contacts are normally open, and will close for a short time after the transmitter has "sensed" the holes in the tape and stored the combination, allowing the distributor to operate for one cycle distributing the combination stored in the transmitter. This connection must be made or else the unit will send only garble if it sends anything at all. Attention is called to the fact that the last character switch, the out of tape switch, and also the added stop switch are all normally closed.

One change which can be made is a matter of preference. Using the circuit as shown in heavy lines, the T-D will shut off after it has read the last character punched, and will not read again until the start button is pressed - providing that the reperf has punched more tape to be read. If the heavy lines are broken at the three Xs and the dotted lines added, the T-D will stop reading after it has read the last character punched, but now if more tape is punched, and the T-D stop button has not been pressed, the T-D will start reading the tape again and will continue until it reads all of the tape again or until the stop button is pressed.

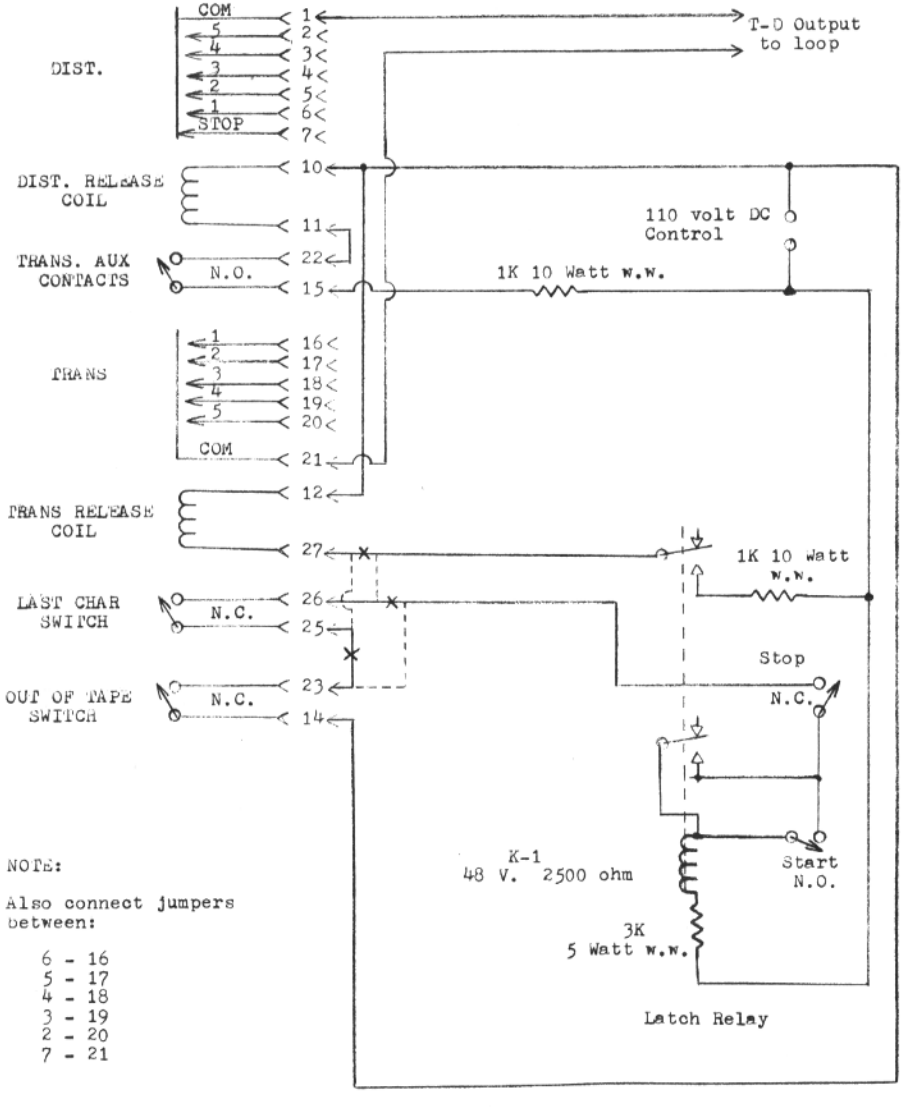
If you don't care about out of tape shut off, simply delete the relay, don't use the out of tape contacts, put the last character switch (dotted lines) in series with the transmitter release coil,

and finally replace the relay contacts in series with the transmitter release coil with a SPST switch which becomes the T-D operate switch. If you don't use the latching relay, and the T-D should ever run out of tape, it will send "letters" continuously until shut off manually.

The pin numbers given are for the Amphenol 26-4401-32S connector on the LAXD-1, and will probably be good for most units. If you are not sure, a simple ohm-meter check can be made. Please note that the 110 volt DC input is a control voltage source and not the loop. The loop supply can be used if it is hefty enough (allow about 300 ma. for the control circuitry), but a separate control power supply would be best. The only connections made to the loop are the two T-D output wires hooked in series with the printer etc. If heavy arcing is experienced at any control contacts, they should be shunted by a series RC arc suppressor network.

The basic hook-up for the LBXD T-D is essentially the same as shown for the LAXD. The elaborate out of tape circuit is not required with the

CONTINUED ON PAGE 12



Narrow Shift - Active imput Filter

HOWARD L. NURSE, W6LLO
6655 Maybell Ave.
PALO ALTO, CA. 94306

The current upsurge in active filter interest, fueled by the abundant availability of inexpensive IC operational amplifiers, has encouraged the design of an active input bandpass filter for use in a new RTTY demodulator we are developing at W6LLO. The 2.1 kHz IF filter our receiver uses in the RTTY mode is much wider tha necessary for 170 Hz shift. Rather than modify the receiver to reduce the excessive bandwidth, we decided to include a narrow input filter as part of the demodulator.

Figure 1 shows the frequency response of the resulting 4-pole design. As adjusted, the filter has O-dB insertion loss with a 3-dB bandwidth of 345 Hz. The upper and lower 20-dB cutoff frequencies are 2507 Hz and 1948 Hz respectively. The data for the curve was taken using the Heath IB-101 Frequency Counter, Audio Generator, and VTVM. The filter design is based on nomographs published in EDN magazine.

The schematic and parts list for the 4-pole filter is given in Figure 2. AR-1 and AR-2 can be any standard high gain audio op amps: we used the 741 since it is readily available, and its internal compensation simplifies construction. The capacitors should be of good quality to guarantee bandpass frequency stability. The "Orange Drop" difilm dipped tubulars by Sprague work very nicely in this application. R4 and R8, which can be the Mallory MTC series, provide a means to tune the filter.

Tuning the filter is most easily done with a frequency counter, audio oscillator, and voltmeter, although a signal from the receiver can be used with a tuning indicator or scope. Connect the audio source to the filter input and monitor the filter output at TR-1. With the signal source frequency set to SPACE (2295 Hz), adjust R3 for maximum output amplitude. Shift the input signal frequency to MARK (2125 Hz) and adjust R7 for maximum output amplitude. Repeat the procedure until channel balance is attained.

Matching the filter input and output to source and load impedances is easy

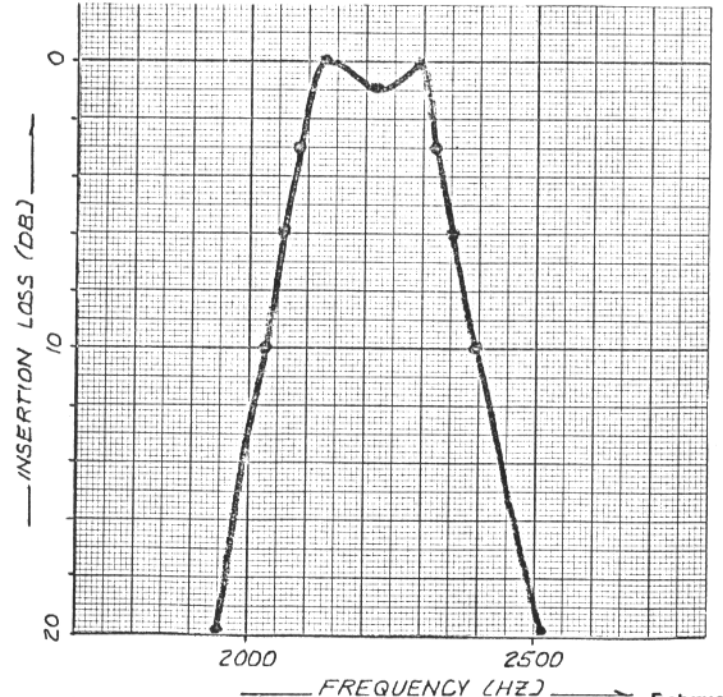


FIGURE 1: INSERTION LOSS VS. FREQUENCY FOR INPUT BANDPASS FILTER

because of the nature of the design. The filter input impedance, when the value of R1 is much less than R2, is primarily determined by R1, which is chosen to equal the receiver output impedance (for example, 600 ohms). The output impedance of the filter is determined by both the op amp and the closed-loop gain of the output stage. The typical output impedance of the 741 op amp is 75 ohms, which is reduced to less than 1 ohm by the feedback.

Because only audio frequencies are of concern with the filter, circuit layout is not critical. As usual, the op amp power supply leads should be bypassed to prevent nearby FR from interfering with filter operation.

The total cost of the input bandpass filter is under five dollars using 741 op amps available from many of the "surplus" component suppliers.

Norman P. Doyle, "Swift, Sure Design of Active Bandpass Filters," **EDN**, January 15, 1970, pp. 43-50.

Jerald G. Graeme, Gene E. Tobey, and Lawrence P. Huelsman, **Operational Amplifiers: Design and Applications** (New York: McGraw-Hill Book Company, 1971), pp. 440-441.

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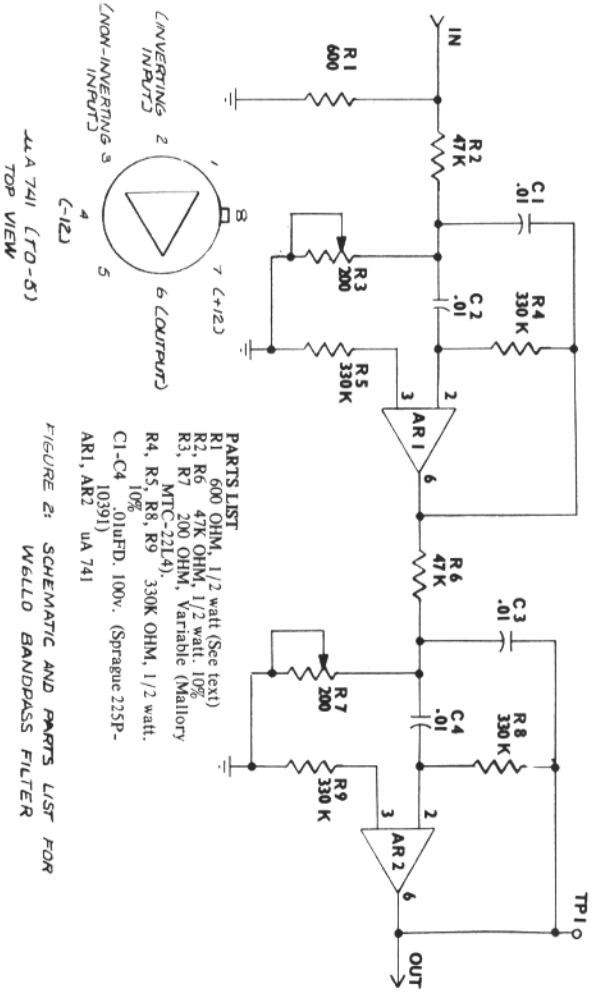


PARTS LIST

R1 600 OHM, 1/2 watt (See text)
R2, R6 47K OHM, 1/2 watt. 10%
R3, R7 200 OHM, Variable (Mallory MTC-22L4).
R4, R5, R8, R9 330K OHM, 1/2 watt. 10%
C1-C4 .01uFD. 100v. (Sprague 225P-10391)
AR1, AR2 uA 741

FIGURE 2: SCHEMATIC AND PARTS LIST FOR W6LLO BANDPASS FILTER

OSCAR 6 & RTTY

ELMER MOORING, W3CIX
9318 Millbrook Rd.
Ellicott City, MD 21043

Part 1

INTRODUCTION

The Australis-Oscar-B amateur radio satellite (AO-B) scheduled for launch this summer offers an excellent opportunity for the RTTY enthusiast to demonstrate the capabilities of radioteletype. Two way amateur communications through this satellite via CW, SSB, RTTY, and SSTV is encouraged. Satellite status will be monitored by a 60 channel RTTY telemetry encoder as well as a 24 channel Morse encoder and transmitted from the spacecraft through one of the downlink transmitters. These data will be of utmost importance to AMSAT (Ref) satellite control centers; thus, the most visible demonstration of the unique capabilities of the RTTY mode will be the reception and handling of these telemetry data.

THE SATELLITE

AO-B is scheduled for a piggyback ride into space along with the NASA launched ITOS-D weather satellite in the summer of 1972. Upon successful orbit, this 50 lb. satellite will be named OSCAR 6. Radio amateurs on at least three continents are presently designing and constructing portions of AO-B which is expected to have a life-time of about one year.

Students at the University of Melbourne in Australia are assemblying a hard limiting FM repeater for 145.8 MHz input and about 1 watt output on 435.1 MHz. This group is also responsible for the RTTY telemetry data encoder which is presently near completion.

The EURO-OSCAR translator (linear repeater) has been completed and shipped from Germany. This device built by DJ4ZC and DJ5KQ receives signals centered around 432.1 MHz and delivers 10 watts PEP centered at 145.95 MHz over a 50 kH bandwidth.

AMSAT members in the United States have completed a two watt translator with 145.95 MHz input and 29.5 output center frequencies with a 100 kHz bandwidth. AMSAT is integrating the several contributions into the complete spacecraft and coordinating the launch effort. A Morse code telemetry encoder has been built by John Goode W5CAY. This unit has been performing splendidly in tests conducted to date. A breadboard version of the AMSAT translator has been tested during light aircraft flights during 1971 and many amateurs operated through this unit during these tests. Both this and the EURO-OSCAR translator are designed for two way communications suing CW, SSB, RTTY, and SSTV.

RTTY TELEMETRY

The RTTY telemetry encoder will provide 60 channels of satellite date including solar cell currents, battery voltages and charge/discharge currents, transmitter power, temperatures, etc. These data will be converted to 60 speed RTTY and transmitted on the low frequency edge of one of the translators (2 or 10 meters). The received print-out will consist of 5 digit numbers, ten numbers to a line, for six lines. An additional two lines of print will indicate the satellite orbit number and operational mode. The format will be the subject of a future column in the JOURNAL. With this information, any receiving station will be able to convert the print-out into satellite parameters by a table look up technique.

With the large volume of data expected from the satellite, it would be a tedious task to process these data by hand. Computer programs are being written to accept 5 level RTTY tapes and convert these to ASCII (computer code) for direct computer interfacing and printout with proper headings, units, flags for out of tolerance readings, and suggested actions to be taken by satellite controlling stations. W3CTF has demonstrated a program for convering 5 level tapes into ASCII and computer printout of the input data, while W30TC is preparing the data manipulation program in PDP-8 software. These programs will be furnished to those having access to appropriate computers.

TELEMETRY DATA RELAY NETWORK

To expedite data analysis and satellite control decisions, received data should be gathered at the various processing centers for correlation and analysis. Hopefully an efficient relay network can be established and tested before launch date. The author is presently working to coordinate this effort

CONTINUED ON PAGE 15

RTTY theory & applications-

RON 'RG' GUENTZLER, W8BBB
Route 1 Box 30
ADA OHIO, 45810

LOOP SUPPLIES

Upon occasion, we have had requests and inquiries regarding power supplies for TTY loops. The following will give some construction information.

The basic requirement for a loop supply is 130 to 260 volts, dc. It must be capable of continuously supplying that voltage at 60 mA. There is no real upper or lower limit to the supply voltage. Below 130 V, time constants in the loop may become troublesome. Above 260 volts, the voltages start becoming rather hazardous. (Even 130 volts is lethal, but the danger increases as the voltage increases.) "Real" telegraph loops usually work at 260 volts.

The reason that the voltage, per se, is not too important is that the loop is made to operate with a specific current, usually 60 mA. Therefore, once the supply is built and operating, you place resistance in series with the loop to set the current at the desired level. The higher the voltage, the higher the resistance required and the more power "wasted" in the series resistance. However, because of time constant problems, the more power wasted in the resistance, the better the loop characteristics!

If you have more than one loop to operate you can use two difference approaches to supplying them. 1) Build a separate power supply for each loop, or 2) Build one supply that is large enough to handle all loops at once. The advantage to several "small" loop supplies is that they can be "floated" (not grounded or isolated) and this can be used to advantage for keying other loops, etc. (see the scheme used in the TTL/2 and the ST-6, for example). The approach used here was to build one big supply (130 V, 1 A), ground the negative terminal, and run whatever is desired from it (telegraph loops, vacuum tube keyers, vacuum tube TUs, etc.).

If you have intentions of building a TU such as the ST-5 or ST-6, you can buy the power supply components for it now and build a loop supply. Later, you can cannibalize it and reuse the parts in the complete TU. This is a very economical approach. (For the ST-5 power supply see: RTTY, 1970 MAY, p. 7; for the ST-6 power supply see: RTTY, 1970 SEP, p. 11.)

If you want to build one from scratch, you might try the circuit shown in the figure. Basically, it is a simple full-wave brdige rectified supply with capacitor input filtering. The transformer is a simple "isolation" transformer. The advantage of using one is that it can always be used for its original purpose if you no longer want it for a loop supply. Suitable type numbers are: Allied 6K112HF, 6K38VCP; Essex (Stancor) P-6410; Triad N-51X, N-68X. These are all 35 or 50 VA transformers. Many more are available in higher power (VA) ratings.

For the rectifiers, the old standby 1N4005 is an excellent choice. If you want a bridge assembly (all four diodes in one blob), try the Motorola HEP177 (280 Vrms, 1 A), Mallory FW-600 (600 PRV, 2 A), or the International Rectifier 18DB4A (282 Vrms, 1.8 A). These packages are in the $2 price range.

If you use one of the transformers listed (or a higher rating isolation transformer), you should use a capacitor-input filter, as shown. For the input capacitor, C1, try 10 to 20 uF at 200 V dc. The capacitor size will control the output voltage. For the output filtering, C2, use something in the 500 uF range, or higher. We have used the Mallory HC20005 (500 uF, 200 V). The Sprague 142F200BC (1400 uF, 200 V) will work nicely.

A 2 H choke rated at 60 mA or higher should be used. The Allied 6X19HF, Essex (Stancor) C2325, or the Triad C-21X should be adequate; they are rated at 200 mA or higher.

You can try using an old TV set power transformer. Unfortunately, they are usually rated at voltages a little higher than really desired. By using one in a conventional full-wave, center-tapped circuit with choke input filter, it might be possible to get the voltage low enough to be suitable. If you use a choke-input filter, make sure that there is a load across the output at all times because the output voltage tends to get quite high under no load. A simple wire-wound resistor drawing 10 to 20 mA should be suitable.

That's it for loop supplies. In summary, you want a supply capable of continuously supplying 60 mA, or higher, at 130 to 260 volts.

For those who are interested in constructing what appears to be "the last word in TUs", see "Phase-Locked Loop RTTY Terminal Unit," Ed Webb, W4FQM, Ham Radio, 1972 JAN, pp. 8-19.

73 ES CUL, RG

***

OOPS - We Goofed--

It's all our fault we left off the identification. The good looking fellow in the picture on page 10 of the January issue is Guy Baron, 9Q5BG. Looks as if Guy not only has a nice RTTY set up but some SSTV as well. Nice DX for either mode. Sorry Guy--

***

Be Broad Minded-

Use NARROW Shift-!

***

*****

Contest Results

CONTINUED FROM PAGE 2

Single Operated

No.	Station	Score
* 1.	I1KG	1,595,370
* 2.	W3KV	1,188,996
3.	I6CGE	1,000,044
* 4.	W4YG	966,652
5.	I5MPK	955,440
6.	I1CAQ	918,994
* 7.	YV5AS	865,000
* 8.	WA2YVK	790,436
9.	WA3KEG	785,390
*10.	ON4BX	778,450
*11.	9I7ED	753,270
*12.	G3MWI	748,854
*13.	IT1ZWS	725,446
14.	I5CLC	721,246
*15.	KH6AG	720,916
*16.	VE2LO/W6	707,534
*17.	EA7PZ	691,344
*18.	JA1ACB	683,740
*19.	KZ5LF	613,855
*20.	9Q5BG	605,110
*21.	VE7UBC	605,100
*22.	K7MNZ	557,890
23.	W4EGY	493,755
24.	W7TZL	490,248
*25.	CE3EX	452,516
*26.	WAØTLT	443,478
*27.	W1KJL	393,315
*28.	DJ9MJ	377,700
*29.	W8CQ	365,112
*30.	SM4CMG	355,434
*31.	PY2CBS	348,115
*32.	VE6LZ	331,364
*33.	K6YUI	319,044
34.	WB6IMP	313,306
35.	ON4CZ	280,372
36.	W3CIX	274,488
*37.	W9YGN	267,060
*38.	K5ARH	249,622
39.	DL1VR	240,445
40.	WB6RXM	237,842
*41.	F9RC	228,205
42.	F6AOE	216,894
43.	W1GKJ	208,796
*44.	FO8BO	198,100
45.	WOHAH	189,400
*46.	KL7GPS	186,885
47.	K7BVT	185,544
48.	W6JOX	168,760
49.	SM3DKL	152,220
*50.	XE1YJ	124,500
51.	WØMT	123,150
*52.	ZL2ALW	115,425
53.	WA5LJZ	100,875
54.	I6THB	98,380
55.	VE6MM	80,640
*56.	VE4FG	74,230
57.	W7RGL	73,365
58.	K6RTV	68,890
*59.	VO2AF	67,292
60.	DJ8BT	59,592
61.	I1DML	57,205
62.	VE4SC	54,035
63.	W6AEE	53,200
64.	SMOOY	42,786
65.	DLOAK	36,388
*66.	HK3SO	33,705
67.	K8KAG	28,880
*68.	EI5BH	27,712
69.	ON4WG	21,460
*70.	OZ4FF	20,398
71.	VE7AKE	19,500
72.	WA7CIP	19,220
73.	I1AMP	17,010
74.	K1SGU	16,760
*75.	K2RYI	16,546
*76.	LX2BQ	15,264
77.	VE6AVQ	15,142
78.	WAØCWH	11,604
79.	JA1FFX	11,305
*80.	OK1MP	11,280
*81.	PAØWDW	9,880
*82.	HA6KNB	9,010
83.	WA6WGL	7,148
84.	PAØSCH	7,120
85.	VE7AFJ	6,105
86.	VE6ANE	5,930
*87.	IS1AOV	4,248
*88.	VE2AXO	3,936
89.	OZ6OB	3,600
90.	LX2FD	2,772
91.	W9WYL	2,148
*92.	VE3TA	2,114
93.	VE3CWO	1,910
94.	W7GNP	1,730
95.	HA6NA	700
96.	W8TCO	122
97.	SK4SSA	20

Multi-Operated

1.	VE2LO/W6	709,370
2.	DL8VX	691,862
3.	HA5KBF	372,416
4.	WB6SCH	323,205
5.	UK4FAD	140,112
6.	W5CEG	116,460
7.	KL7AIZ	46,584
8.	HA5KFB	35,828
9.	DK1AQ	14,768
10.	HB9FT	2,754

SWL Printer

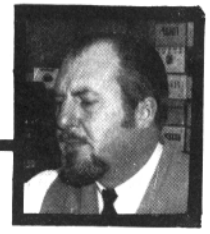
1.	Paul Menadier	455,468
2.	Sandy Morton	243,036
3.	Paul Kueng	174,620
4.	Robert Hudyma	

* Certificates to be issued to the top scores in each U.S.A. and Canadian District and each Country.

*****

RTTY-DX

JOHN POSSEHL - W3KV
Box 73 Blue Bell, Pa., 19422



Hello there . . .

If the activity that started off the New Year continues, 1972 promises to be a great year for the RTTY DXer.

The first day of the year started off with activity from GW3NJW, Cardiff, Wales. Although Clive was quite weak here in the States he was 599 on the Continent and is in many logs for a new country at this time. His shift was quite odd at the start but the boys quickly got him adjusted right on the air and he now has an excellent narrow shift signal. At the time of this writing Clive has been quite active daily from about 1100 to 1500z daily on 14 mhz.

From the opposite side of the world Gin, JA1ACB, reports contact with a new country in the USSR. UK9OAA in Zone 18 has been active and Gin reports good copy, although in reverse shift, at around 0700z on 14 mhz. The call sign indicates that it is a club station and Zone 18 would put him on the Asian Continent. Gin also says that Burma and Thailand are still on the banned list as far as RTTY is concerned. At the moment he is also trying to agitate JT1KAA into trying some FSK and if successful this would be a real "first" on RTTY. On the local scene in Japan, JA7UZ is a new arrival on RTTY.

Although the main part of the DXpedition will probably be over by the time you read this, anyone at all active on RTTY must have surely printed the wide spread publicity given the island hopping trip made by Paul, KH6AG. The boys made good use of their reperfs and the word was passed far and wide for at least two weeks prior to the start of operations. Paul was due on Guam on or about 12 January and after a few days of getting the real reason for his trip squared away, (his work) he was due to be on Saipan. From there the possibility was good for operating from Truk and Ponape in the Eastern Carolines and from Majuro and Kwajalein in the Marshall Islands. In preparing for the trip Paul brings out an interesting point. Most of these islands are located in Trust Territory and administered by the Trust Government. As such, RTTY was, and is, only permitted on 40 Meters and it was necesssary to obtain special permission to operate RTTY on the higher frequencies. He was also assigned a new call for the trip, KG6SR. So if you fellows were monitoring 14080, 21080, and 28080 in mid January the chances are that you racked up a few new countries. If not, have patience, as Paul expects to be in the area again at a later date. Ken, W6WIS was assisting Paul in the early stages but returned to the States after the first week. The typing was done on a Mite and the input and output on a FT-101 transceiver.

Mark, W5EUN, sends along some very interesting information; some current and some for the future. Very recently on 14095 he printed someone apparently tuning up and finally printed out 7Q7RT but repeated calls were greeted with silence. Could this be rare Malawi or a pirate? Anyone out there know anything about this station?

From DL8VX, via Mark. Those of you still looking for Fred, YBOAAO might look in on his weekly sked with DJOAK on 21185 SSB at 1400z. A connection there might lead to a RTTY QSO. DL8VX is also licensed as FOBT and this coming July will try a DXpedition to Andorra, C31. Wolf has tried to be QRV from Vatican City but had no luck on getting RTTY permission. OHONI, Aland Island, is know to be QRV but no permission to FSK at this time. We understand that machines can be made available to Poland and Bulgaria if they are permitted entry and can be used on amateur RTTY. We certainly hope that these problems can be overcome in the near future as it would add two rare countries to the ever expanding list of active countries on RTTY.

As mentioned last month, Bill, HP1XHG is now QRT. However, those of you still needing a QSL might try this QTH with SASE (IRC).

Scott's QSL Service
1510 Lynnview
Houston, Texas 77055

We mention it because we recently received separate QSL's via the W3 bureau from this source for every QSO we ever had with Bill and some of them date back a few years. Apparently they have Bill's logs as the cards came unsolicited.

The last days of the old year brought W A C Certificates to the following stations ...

Nr. 180 Bill Thompson VP7NH
Nr. 181 Carlo Ciapetti I5CLC

Congratulations to both on receiving the Award.

You will perhaps recall that in the November column we wrote about an arrangement made with the SARTG for issuance of the WAC Award based upon the activity and the logs submitted in the SARTG Contest. A number of WAC Awards were issued in co-operation with Contest and Awards Manager, Bo, SM4CMG, as a result of this arrangement. We are now pleased to inform you of a similar agreement made with the BARTG and their Contest and Awards Manager, Ted Double, G8CDW. The rules are the same. If you enter the BARTG Spring Contest, held this year the weekend of March 25 - 27th and make WAC in the Contest, you may, at the same time you submit your log to Ted put in a claim for the WAC Certificate as issued by the RTTY Journal. Ted will check the logs, and provided the correspondant station submitted a log, he will forward to me in writing the necessary information and I in turn will issue the certificate either directly from here or through Ted and the BARTG, which ever is more practical. Ted also says that present holders of the QCA Award may also apply for the WAC Award if they do not already have it and if their original submission of cards to him included confirmations from all six continents. This all sounds quite complicated but if you read it again I'm sure it will clear itself up.

Ted kindly sent along the list of the holders of the QCA Award as of 11 November 1971. The list follows and the call sign is followed by the number of countries confirmed.

ON4BX	101	W5QCH	53
W3KV	84	I1WT	50
ON4CK	79	W8CQ	50
K8YEK	75	G8LT	47
DL1VR	64	I1CAQ	44
DJ8BT	57	SM4CMG	43
I1KG	57	W6AEE	39
WA6WGL	57	WB6ADY	38
DJ6XBA	54	VK3DM	37
G6JF	53	FG7XT	35
DL8VX	34	DJ9XBA	26
OK1MP	34	EI5BH	26
ZM2ALW	33	I1CWX	26
G2HIO	32	G3CQE	25
VE7UBC	32	G3IYG	25
K4VDM	31	I1ORS	25
W6CG	31	K3SWZ	25
VU2KV	30	KG6NAA	25
W8GPB	30	VE3AYL	25
DL8CX	28	VE3IR	25
WB6QFE	28	VE4BJ	25
DL1TV	27	W1GKJ	25
HA5FE	27	W2UGM	25
K8MYF	27	W5VJP	25
W2RUI	27	W8CAT	25
W3CIX	27	WA8BOT	25
DK3CU	26	WB6RXM	25

QUARTER CENTURY AWARD

The QUARTER CENTURY AWARD is issued by the British Amateur Radio Teleprinter Group on the submission of satisfactory proof of Two Way RTTY Communication with 25 different countries. Measuring 10" by 13" and printed in Red and Green the Certificate makes an attractive addition to any Amateur Radio Station. Endorsement stickers are available for each additional 25 Countries. Application for the Award may be made by the following methods.

1. Submission of QSL cards for the Countries being claimed. These cards are returned to the owner after checking. Alternatively, submission of Photostat copies or clear Photographs of QSL cards. Such photostats should clearly show the call sign of the Amateur making the claim and also establish the fact that the contact was made using RTTY as a mode of communication. This type of claim must be witnessed and signed as accurate by TWO other licensed amateurs.

2. Claims may also be accepted based on a Contest log submitted for any Contest sponsored by the BARTG. The claim for the QCA Certificate should be made at the same time the Contest log is submitted.

Cost is 2 Dollars US or 8 IRC. Send claims to --

Ted Double, G8CDW
89 Linden Gardens
Enfield, Middlesex, England

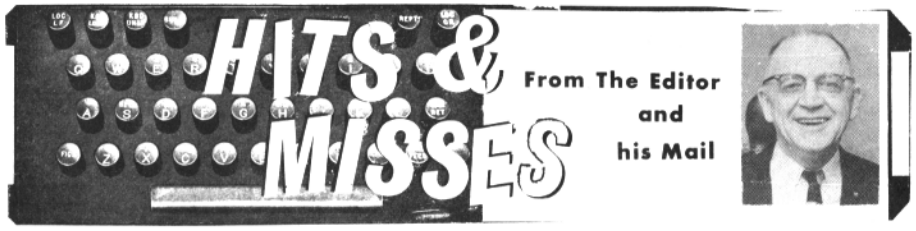
73 de John

***

Be BROAD Minded---

Use NARROW Shift !!

***



It has been a long time! - but the bottom of our barrel of articles is showing in spots.

Several months ago we asked for suggestions as to the type of article our readers would like. Probably 90% of the comments just said "Keep it like it is"

We are again asking for help. Anything from sophisticated IC ideas to simple beginners ideas are welcome. Short-hints and kinks-ideas are always needed and useful. We still have a few photos on file but more will soon be needed, remember we like the operator in the picture if possible. Commercial RTTY frequencies are always in demand especially since the complete list published over a year ago is out of print. FSK or modifications of popular exciters are always appreciated. In fact any type article seems to appeal to some and we try to keep a balanced assortment from issue to issue. We dislike asking for frosting on our cake but it makes it much easier if any manuscripts are typed on a regular typewriter, not a RTY printer, as this must be retyped for the printer to use. Short articles may be hand written and we will type them but long articles for us to retype pose a problem and if we retyped them would sure to be full of mistakes. Drawings should be BLACK on white - gray copies do not reproduce, we can use almost any size drawing but if it is large be sure that the lines are heavy enough so that when reduced they will be legible. -- Boy do we have problems with drawings ... We plan on re-running some of the popular articles from past years that are not available but we hate to think of our barrel without enough wine to cover the bottom. Who can help us?

***

One new column that is starting in this issue is "Oscar 6 and RTTY." A reading of the column will explain it better than I. It promises a lot of interest and possibilities for RTTY operators and experimenters. W3CIX will keep the data up-to-date every month. Any questions should be addressed to him and please - A SASE with your requests.

***

By the time you read this we will probably be out of Binders - More are on order but from past experience delivery is very slow and uncertain. Any orders not filled will be shipped as soon as possible or we will be glad to refund if you wish.

***

Besides the Dayton Hamvention in April we hope to make the ARRL Great Lakes Division Convention, March 17-18 at Muskegon, Mich. We understand there will be a RTTY forum among many others. Full information from Henry Riekels, Jr. W8GVK, PO Box 691. Muskegon, Michigan 49443.

***

28 RT Set -

CONTINUED FROM PAGE 4

LBXD since its out of tape switch is spring operated rather than cam operated as in the LAXD. Also, for those with an LBXD or another LAXD, the transmitter from one T-D can operate the distributor in the other unit or vice-versa. Simply replace the transmitter output-distributor input jumpers with a multi-pole two position switch. Be sure to bring along the transmitter auxiliary contacts and the release coils. This is handy if you have a 28 ASR.

My 28 RT set is very similar in appearance to the older FRXD. Other units come mounted on a tape handling stand, which includes large tape take-up and supply reels as well as an intermediate storage bin. Additionally, the LAXD can be mounted in the 28 ASR providing an RT set within the cabinet. I built an intermediate storage bin patterned after the Teletype Corp. unit from Plexi-glas and press board and this hangs on tea-cup hooks below the shelf which supports the RT unit.

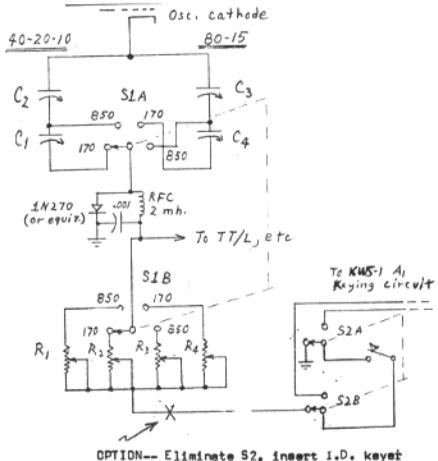
***

KWS-1 FSK Modification

CARL STEAVENSON, WB6RXM
13638 Sproule Ave.
SYLMAR, CA. 91342

The simplest way to adapt the KWS-1 and similar transmitters to F1 is to plug an AFSK oscillator into the mike jack and forget it. Wishing to avoid the possibility of transmitting on two or three frequencies simultaneously, however, I chose to use the "Mainliner" saturated diode approach, successful with many other transmitters.

The only problem with the KWS-1 is that the PTO must be positioned differently for each commonly used RTTY frequency range, 80 thru 10. This requires that a different capacitance be effective on each band to obtain the same nominal shift. But, within reasonable limits, the same capacitance can be used on 40, 20 and 10 meters for 850, with a different capacitance sufficing for both 80 and 15. Adding the option of 170 (happily the most-used shift) requires two more capacitors; C1-C4 in the schematic provide 850 and 170 shift on all five bands.



C1-C2-C3- Johnson 5MB11,5-11p.f. or equiv.
C4- Gimmick: Approx. 1" twisted pair, 7 conductor, insulated. (PVC)
R1- R4- 500 ohm trim pot, or equiv.
S1- 2P4T rotary
S2- 2P2T rotary.(optional).

Note that the 40-20-10 capacitors, C1 and C2, are in series for 170 shift, as are C3 and C4 on 80 and 15 for 170 Hz. Series connection was neccessary only because of the relatively high minimum capacity of the available Johnson 5MB11. C4 had to be a "gimmick" -- a pair of insulated wires twisted together. If available, superior capacitors adjustable to a much lower minimum could be used to eliminate the series connection as well as the gimmick.

S1B switches in one of four pre-adjusted pots for desired FSK I.D. shift S2 was added for convenience in switching from F1 to A1 mode, precluding the need to move the bug plug.

Physically, the netword was assembled on perf. board and mounted with an aluminum bracket on the power amplifier enclosure, relying partially on the S1 and S2 shafts for support. The two shafts emerge from the front panel through enlarged holes initially retaining the COLLINS name plate.

This modification will not provide precisely the same shift band to band, but has been in use for about three years with no problems and no complaints. Shifts were adjusted most precisely on the bands most used, 15 and 20. All adjustments are "set and forget," except when replacing oscillator tubes

***

BACK ISSUES-

New subscriptions and classified ads are cash in advance as we have no method of billing. New subscriptions will be started with the current issue and one back issue if requested. Please do not ask us to start any further back than this. If available, back issues may be ordered at 30¢ each at time of subscription. The Journal is mailed about the 20th of the month preceding the dated month.

The ONLY back issues available are listed below. 30¢ each.

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1968-Mar.-May-June-Sept.-(4)
1969-May-Oct.-Nov.-Dec.-(4)
1970-None
1971-Jan.-Apr.-May-June-July-Sept.-Oct.-Nov.-Dec.-(9)
1972-Jan. (1)

RTTY JOURNAL
P.O. Box 837 Royal Oak, Mich. 48068
'DUSTY' DUNN - W8CQ
Editor and Publisher

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CLOSING DATE FOR ADS- 1st of month.....

NEW HAM MAGAZINE!! Interested in public services, humanitarian actions and international friendship? Sample issue free. Published every three weeks. Worldradio, 2509 Donner Way, Sacramento, Calif. 95818 WB6AUH

HAL DEVICES: HEADQUARTERS for MAINLINE Solid state RTTY equipment. You can do no better than the ST-6 demodulator at any price. Screened, punched cabinets for the ST-6 will be available soon. For budget TTY, consider the RT-1 for VHF, the ST-5 for HF. And the best in AFSK is provided by the AK-1. Our new model 1550 electronic keyer, or the MKB-1 Morse Keyboard, will automatically identify your RTTY station at the push of a button. The extra values are available from HAL Devices, Box 365RJ, Urbana, Ill. 61801. Phone 217-359-7373.

WANTED; TAPE OR PAGE PRINT for copy, Gemini 6,7, etc. Missed last part - ran out of tape - W5TZB, Rte 1, Box 193A. Pojoaque, N.M. 87501.

MODEL 28 TYPING REPERFORATOR transmitter distributor, with tape handling stand, with two tape reels, synchronous motor. Transmitter- distributor type LPR3ARZ with 60-75-100 wpm 3 speed gear shift. Typing reperf type LRXB27 also with three speed gear shift. O/A dimensions 36" high, 20" long, 8-1/2" wide. Used excellent $150. Atlantic Surplus Sales, 580 3rd Ave. Brooklyn, N.Y. 11215.

FOR SALE; 100V Exciter - built in RTTY FSK, Stable, excellent condition, manual and original shipping carton. $275. W8JYZ, M. Bacow, 2609 Birch Harbor Ln. Pontiac, MI. 48053.

MODEL 15 PLATEN HANDLE - $3; Perforator tape, 40 roll case - $6.50; Model 14 TD - $22; 3-speed gear shift for M28 TD (#195442), new, in original boxes - $48; Teletype manuals, M28 ASRs, ROs/KSRs, reperfs - theory, adjustments, parts (specify which of the 3) - $1 each postpaid. Sweep frequency audio generator; 1/2, 1, 2 & 4 RPM - $35. Jim Cooper, POB 73, Paramus, NJ 07652.

W.C.I. PHASE LOCKED LOOP TU- completely wired and tested, plug-in PC boards with sockets, now available for $100.00. All you add is 12 volts and your loop supply. Full 2 year warranty on boards. AFSK and weak signal detector boards soon to be available. SASE for RTTY buyers guide. W.C.I. PO Box 17, Schaumburg, Ill. 60172.

HAL DEVICES: Announces the revolutionary new RVD-1002 and RKB-1 solid state RTTY system. Provides the ultimate in noiseless, reliable reception and transmission of Baudot coded TTY. The RVD-1002 visual display system receives demodulated TTY pulses from the ST-6 and provides video output to a video monitor, or modified TV set. One thousand (1000) characters are displayed in a 20 line, 50 character per line format, at 60, 66, 75, and 100 WPM if your TU will copy it. The RKB-1 combines reliable TTL circuitry, a high quality commercial keyboard, and a rugged case to provide the best Baudot TTY keyboard available.. The electronics is arranged so that you type as if you were using a typewriter. See them on display at SAROC, Wheaton, and Dayton. Get the details from HAL Devices, Box 365RJ, Urbana, Ill. 61801 Phone 217-359-7373.

TTY Ribbons, black, 6 for $2.00, 12 for $3.50, postpaid, Paul Davis, 1830 Toepfer Rd., Akron, Ohio, 44312.

SALE: TYPING REPERFORATOR - Kleinschmidt TT-230, 100 WPM, good condx, $30.00. Pick up or you pay shipping. Frank Fallon WA2YVK, 118-43 228th Street, Cambria Heights, N.Y. 11411. 212-525-4493.

TELETYPE PICTURES FOR SALE. Vol 1 $1.00. Vol 2 $2.00. Vol 3 $1.50. All for $4.00. Perforated tapes available. 200 different pictures. W9DGV-a. 2210-30th Street, Rock Island, Illinois 61201.

TYPEWRITER RIBBON REINKER, Hand operated model now only $3.50. K575 or K764 Ink available at all National Cash Register Co. stores at 75¢ per tube. Walter Nettles W7ARS-8355 Tanque Verde Rd. Tucson, Ariz. 85715

MORE RTTY! THAT'S RIGHT. In 1970 there were more feature RTTY articles in HAM RADIO Magazine than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. $6.00 per year; $12.00, 3 years. Ham Radio, Greenville, N.H. 03048

MODEL 28 TYPING REPERF TRANSMITTER, complete with tape handling stand, reperforator distributor unit, Synchronous 1/2HP motor and two tape reels. 115V 60cy AC. .5 amp max signal input/output 130 V max DC .075 amps max.O/A dim. 36 inches high, 20" long, 8-1/2" wide. Trans- dist. is type LAXD4 with 3 speed gear shift. Typing reperf is type LRXB6 also with 3 speed gear shift. Used, excellent $150.00 each while they last. Unused parts for model 14,15,19,28, Mite and Kleinschmidt machines. Send us your requirements. Atlantic Surplus Sales, 580 3rd Ave. Brooklyn, N.Y. 11215.

MODEL 28 TYPING UNITS: Mark II, sprocket feed, $40 each. CV-116 (B)/URR Diversity Frequency Shift Converter, Manual, crystals for 455 kc and 500 kc IF, $125. AFSAV 133C Diversity Frequency Shift Convertor, manual, $95. Radiation Incorporated TDMS Transmitters, Receivers, Power Supplies. Stelma TDA-2 Distortion Analyzer, $35. RD-92 Fax recorder and CV-172 Converter, both $125. Write for details. F.K. McGinnis, 4304 McFarlin Blvd., Dallas, Texas 75205.

WANTED; MANUAL FOR BOEHME Shift Converter, type 5C. Robert Johnson, American Radio Association, 341 Market St. San Francisco, CA. 94105

TELETYPE MACHINES, TABLES, COVERS, power supplies, reperferators, cabinets, tape punches, parts etc. Loads of electronic equipment and parts also. PC boards, Western Union items, clocks etc, Goodman 5826 S. Western Avenue Chicago, Illinois 60636 (312-476-8200).

FM MOTOROLA SCHEMATIC DIGEST - 136 giant pages 11-1/2 x 17 schematic diagrams, alignment instructions, crystal information, trouble shooting information. $6.50 postpaid. S.M. Wolf, PO Box 535, Lexington, Mass. 02173.

BACK ISSUES - RTTY JOURNAL - Have all issues from Vol. 1, No. 1, will reproduce any issue for $1.00 PP. John Isaacs, 3175 Val Verde Ave. Long Beach, Cal. 90808.

WANTED; BEST PRICED 28KSR. Prefer pick up in Michigan area. Robert Cooper, W8AQA, 132 Guild St. N.E. Grand Rapids, MI. 49505.

SALE; SYNCHRONOUS MOTOR for Mite teletypewriter, 115 VAC, 60 Hz. 1 ph. unused, excellent $27.50 ea. Parts for Mite teletypewriter such as selector magnets, arms, cams, level assembly, latch assembly, blocks, modifcation kits, surtches, platens, pinions, etc. Unused excellent - send us your requirements. Reperforator, TT16/FG includes tape perforator, typing unit, range finder, tape reel, sync motor in metal square cabinet, used good, $35.00 ea. Atlantic Surplus Sales, 580 3rd Ave. Brooklyn, N.Y. 11215.

HAL DEVICES: ONE SOURCE FOR ALL your construction needs. Our line of resistors, capacitors, and semiconductors will fill your requirements for practically any project. TTL devices are stocked in volume to support production of our keyers, identifiers, and the fantastic RVD-1002 RTTY Visual Display System. Fast service at reasonable prices. HAL DEVICES, Box 365RJ, Urbana, Ill. 61801 Phone 217-359-7373.

FAMOUS TTL/2 printed circuit board; last batch of nearly 2,000 still $6.00 ppd. see QST May, '69; also sell MITE midget teleprinter with keyboard, 60hz: write. Jim Salter, K5 BQA 11040 Creekmere, Dallas, Tx. 75218.

WANTED-COLLINS 399C-1 PTO Console. 32W-1 exciter. National HRO-7 receiver. All in any condition. G.S. Naniwada, JA1ACB. 3-4-8, Izumi, Hoya, Tokyo 188, Japan.

SALE; MODEL 14 TYPING REPERFS - send receive, complete with cover, sync motor, keyboard, end of line indicator, excellent $37.50 Model 14 transmitter - distributor, complete with cover, sync motor, excellent $20. ea. Model 28 type box, complete, excellent $15. Platen for model 15 teletypewriter rubber covered, unused, $4.00 Tuning Fork (speed indicator) 96.19 V.P.S. with instructions sheet for using tuning fork to set motor speed of teletype equipment to operate at speeds of 368 O.P.M. and 404 O.P.M. Unused $2. ea.-3 for $5. Drum, fascimile, key design 12-1/2" long, 6" dia, unused $8. ea. Atlantic Surplus Sales, 580 3rd Ave. Brooklyn, N.Y. 11215.

FOR SALE: 28KSR auto CR/LF $200. 32KSR auto CR/LF $225. (Will trade either for three speed shift for 28ASR, TTY p/n 195154). Collins 51S1 mint, commercial (not surplus) with 2.4 KHz SSB filters. $1100. WANT: Compact 28KSR (UGC-20), Typing Reperforator for dome mounting in 28ASR, TTL2, ST-6, 651S1 Receiver. Hank W6SKC, 1015 Fremont Avenue, South Pasadena, Calif. 91030. 213-799-5886.

LEADER-LBO 301 3" TRIGGERED Sweep Scope, $225.00 Garrard SL95B $65.00, TR44 CDE rotor $35.00. All above are new in factory sealed boxes. Also 1- used Ico 720 transmitter $15.00 will ship. Michael Jones, RRt. 1 Box 532, Fortson, GA. 31808.

ARMY SIGNAL CORPS RADIO Teletype control C-808/GRC-26A, S/N 426, Hallicrafters Mfg. (TM-11264A applies) with tubes, less cables, fair appearance, heavy duty input cord, 19" relay rack mounting, 35 lbs net weight. Asking $10.00 FOB or offer or trade? W9DPL, Howard Severied, 3602 West 71st St. Indianapolis, Ind. 46268.

FOR SALE; 28ASR and 28KSR. Both with floor consoles, 60 and 100 gears. Auto CR/LF, non overline, unshift on space. Model 19 with table and TD. Wanted multi-freq. HT-220, HP525A and 525B plug-ins. Make an offer, I need money so will sell cheap. Write or call - 1722 S. 125th East Ave. Tulsa, OK. 74128. (918)-437-4969.

TRADE; 28KSR CABINETS for typing units or other 28 equipment. Raymond Westcott, W7NOM, 399 S. Oregon St., Ontario, OR. 97914.

READY FOR MULTI SPEED RTTY? 195154- M 28ASR shift kit, (60-67-100 wpm). unused $225.00. KSR, LPR, LXD shifts too. 28 RO base with variable speed motor, $95.00. Gov't. Tech. manuals; TM112223, full scoop on M.14 typing & non typing reperf, $16.50; TM 11-2222 for M 14TD, $3.00. Kleinschmidt manuals TD, $2.; JR-TD (TT-176) $6.50; TT-4 page printer $6.50. Manuals postpaid. Many more teletype bulletins. Paper winders M15- $15.00. A few teletype tools for sale. Send $1. for latest tool catalog with list of what we have. Wanted your tools, parts, mod. kits & late machines especially 33ASR. SASE brings list. Typetronics, Box 8873, Ft. Lauderdale, FL. 33310. W4NYF.

4-1000 TUBE, NEW. $75. 24C w/ probes $60. TS34A scope $25. HP560 digital recorders $80. I 193 manual and chest $12. TEK 514AD $135. DYMEC 25038 6 digit $150. USM 105 $425. USM 105 $350. GR133OA, $290, with manual, adaptors and calibrated $360. TDA2 $35. GR1001-A Lavoie Labs LA20M Spectrum analyzer with 120 tuner, no plugins or extra parts to buy, $350. SASE for list of excess and new components. HP425A $40. Kintel 203A, $90. Trade your list for mine. Douglas Craton, 5625 Balfrey Dr. West Palm Beach, FL. 33406.

CHANGE SPEEDS of #28 Teletype machines, military variable speed drive system, 60 to 100 wpm, $100; gear shifts $127, ASR $230. Swaps ok, parts wanted. White. Box 3227, Alexandria, Va. 22302.

NAVY TT-63A/FGC Repeater with 2 spare W.E. relays. $30. plus shipping. W6ONK.

OSCAR 6 & RTTY-

CONTINUED FROM PAGE 7

and will appreciate any suggestions. Any amateur or SWL station not equipped for RTTY reception should be able to record the AFSK data on magnetic tape which can then be played through the local RTTY enthusiast's TU for punching a tape and subsequent relay via RTTY to the various processing centers.

COMING SOON

Coming articles will describe the equipment requirements for receiving the satellite transmissions as well as for communicating through the satellite. The telemetry data format and look-up tables for eyeball data decoding will be presented as well as details of the computer programs and suggested routes for relaying the telemetry tapes.

REFERENCE

AMSAT was formed in early 1969 to foster world wide participation in amateur space experiments and to bring about improved communications for the amateur and other services alike. Membership is open to radio amateurs of all countries and to others interested in amateur space experiments. AMSAT is affiliated with and receives support from the American Radio Relay League. Further information can be obtained from: AMSAT, P.O. Box 27, Washington, D.C., 20044.