Additional Classified on Page 15

WANTED - ALL KINDS of page printers. Any quantity considered, quote your price and a local representative will contact you if reasonable. Lee Brody, N.Y.-N.J. Phone TTY for the Deaf, 15-06 Radburn Road, Fair Lawn, N.J. 07410.

HOT CARRIER DIODES: New HP 2800, 90¢, 12/$10 pp. H A L Devices Box 265RJ, Urbana, Illinois 61801.

THREE BC-221s; All in good condition, with calibration books: $60.00 ea. First three certified checks for money orders take them. G. Seymour, WA2HVN, 433 Valley Dr. Syracuse, N.Y. 13207

FOR SALE: Model 19 - anti glare window, Auto CR & LF, sync motor, w/14 TD. Steel clutch, sync motor and 60 wpm gears. Both newly painted, $150.00. Model 14 typing reperf, keyboard, EOL indicator, sync motor 60 wpm gears, mint condition $50.00 Johnson Courier amp. 500 watts, spare set of tubes, $150.00. 2 4-400 Eimac tubes, new. 2 813. 2 4CX250B tubes. Len Morris VE3FJB, Box 702, Orillia, Ontario, Canada.

FOR SALE: General Coverage receiver, SP600JX with IF output in rear for RTTY. Good condition $175. Elmer Shafer, W8MSG. 3479 Kersdale Rd. Cleveland, Ohio. 44124.

WANTED-MODEL #26 SYNC. MOTOR with pinion gear for western Union printer. Also papercrank, "communication" pallets/keytops and carriage return release lever and associated parts. Need Teletype Bulletins covering "parts" and "adjustments" for model 14 typing reperf. Need back-issues RTTY Dec. '62, Nov., Dec. '63; All '64, '65, '67; Jan.-June '66. Write W7GDQ Omak, Washington, 98841

SALE: COMPLETE MODEL 19 teletypewriter; consists of 15 printer, model 19 keyboard with counter dial, cover, sync. motor, trans-dist. steel table, power supply, $90. each. If packing required add $15. Atlantic Surplus Sales. 300 7th St. Brooklyn, N.Y. 11215.

INTEGRATED CIRCUITS: New Fairchild Micrologic, epoxy TO-5 package. 900 buffer, 914 gate, 60¢ each. 923 J-K flip-flop, 90¢ eac. Guaranteed. Add 15¢ postage. H. A. L. Devices Box 365 RJ, Urbana, Illinois 61801.

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

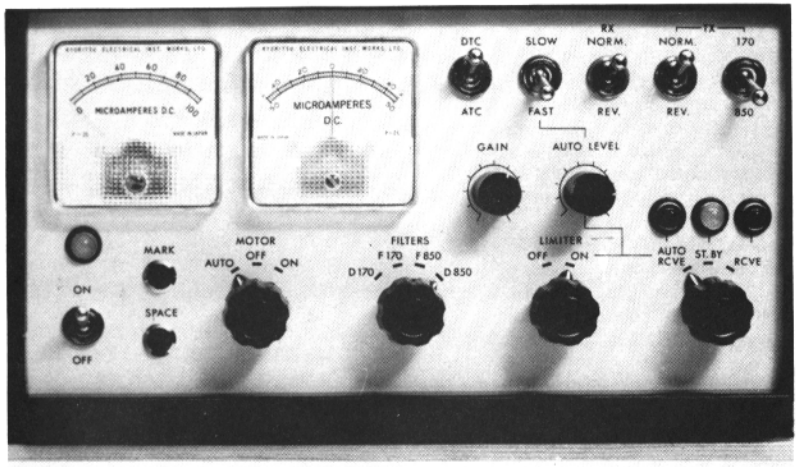
First Class Mail --

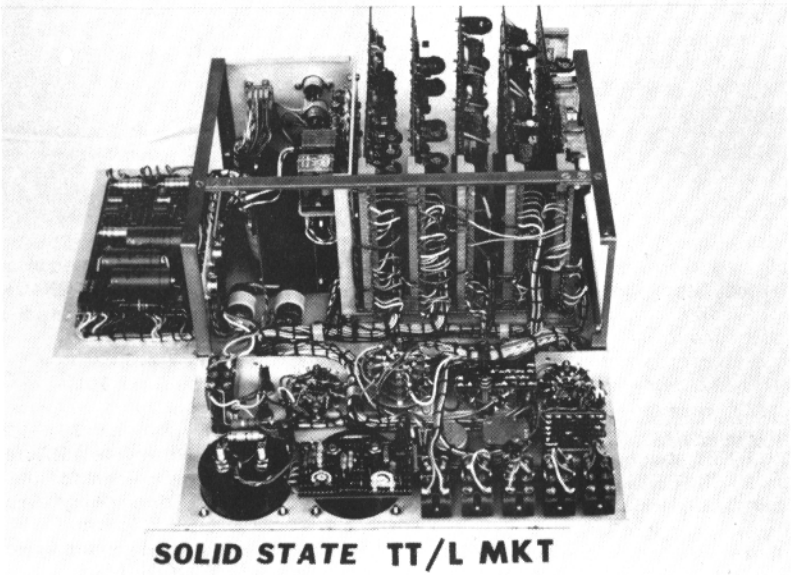
RTTY JOURNAL

December 1969

EXCLUSIVELY AMATEUR RADIO TELETYPE

Volume 17 No. 11 30 Cents





SOLID STATE TT/L MKT

Solid State TT/L--MKT Demodulator.

Ole BERLAND, OZ6OB
32 Syrenvej
2970 Hoersholm , Denmark

*** ***

Editors Note:

Since the TT/L terminal unit was first published nearly five years ago it has become the standard of comparison for demodulators around the world. During the past several years a similar version with all solid state construction has been talked about by many and we know that at least a few have built operating models. We were more than pleased when unexpectedly we received this article in the mail last month. Ole Berland, OZ6OB, the author is on a tour of this country for his business and the article was mailed from New York. We hope to get a picture of Ole for a future issue as well as a little background but until he reurns home this will have to wait. It is one of the most complete and complex articles we have run. I am sure that reading the article and looking at the pictures will impress our readers of the technical know-how and the care and craftsmanship that produced this unit.

Unfortunately with the large number of drawings, we can not run it in one issue. Most of the text and description will be in this issue but many of the schematics will have to wait until next month. We have one problem, with our small page size, some of the drawings identifications are going to be small, in this case there is nothing much we can do except to suggest you use a reading glass or magnifier, this was suggested to us early in the game as a joke and now we mean it seriously. Ole's original drawings are letter head size and possibly we can arrange for Xerox copies for those that wish them.

*** ***

The Mainline TT/L-MKT TU is a completely solid state version of the TT/L demodulator developed by Keith Petersen, W8SDZ and Irv Hoff, W6FFC and the latter modified TT/L-2 developed by Keith Petersen and described in the RTTY JOURNAL September, 1967.

The MKT version has been extended with a matrix system for connections between the RTTY machines and the TU as well as an AFSK/FSK keyer.

The matrix for distribution of the RTTY signals has in principle been described by more authors a.o. Jergen Hansen, OZ7OF in RTTY Journal June, 1968. In the present matrix the connections in the cross-points have been programmed to make operation more easy.

In the AFSK/FSK keyer the target was to make exact symmetrical FSK signals as well as a perfect shift between the Mark (2125 Hz) and Space (2295 or 2975 Hz) sine wave tones without any kicks or overshoots.

Several solid state TU's and AFSK keyers have been presented in the literature. Some of the latest and more elegant circuits are the Mainline ST3 RTTY Demodulator and AK-1 AFSK unit both developed by Irving Hoff, W6FFC (RTTY Journal September-October, 1968).

However, the MKT version includes all filters and automatic circuits (and a little more) as the original Mainline TT/L MK2 and as such offer a high security to read RTTY signals through QRM with a minimum or completely without misprinting, (of course the cost price can not be compared to that of the ST3 AK-1!).

THE BLOCK-DIAGRAM and THE EQUIPMENT SET-UP of the MKT are shown in dwg's no. 001 and 101.

As seen from the set-up, part of the system is placed in a Remote Control Box. This box contains the relays for the TX-RX-Local Loop switching as well as the matrix. The different RTTY machines: page-printer, reperf and TD are connected to the box which is placed next to the page-printer (easy operation).

The TU is in a cabinet with same size and shape as for the DRAKE T4X transmitter. Only SHIFT and BALANCE indicators are built-in; - the very useful oscilloscope indicator (cross-pattern, flipping line or analyzer -- (The analyzing of RTTY-signals has been described by more authors, a.o. Robert Deseck, ON4CK in RTTY Journal, March 1968) can be connected to the rear panel.

THE TU CIRCUIT (dwg. no. 101)

The general circuitry is in principle exactly the same as for the TT/L MK2. FET's have been used to give sufficiently high input-impedances to transfer the filters, detectors and time delay circuits directly from the MK2 diagram.

To have the signal swing symmetrically

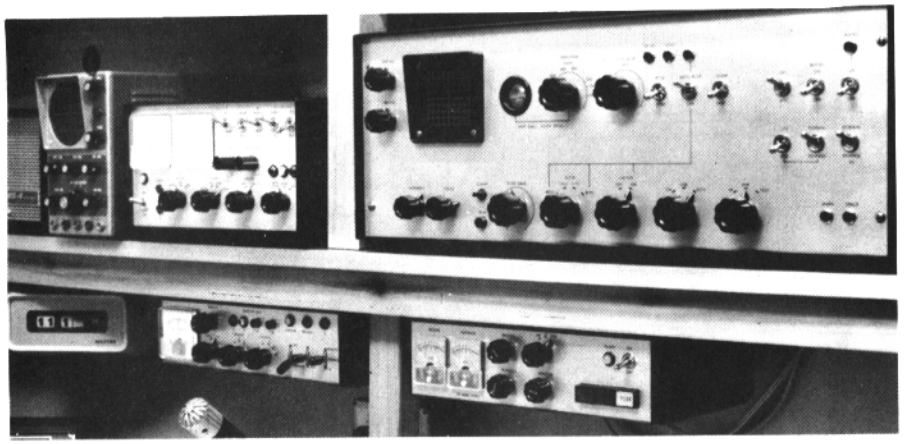


PHOTO IDENTIFICATIONS

Front Page. Top - TT/L MKT Front view.

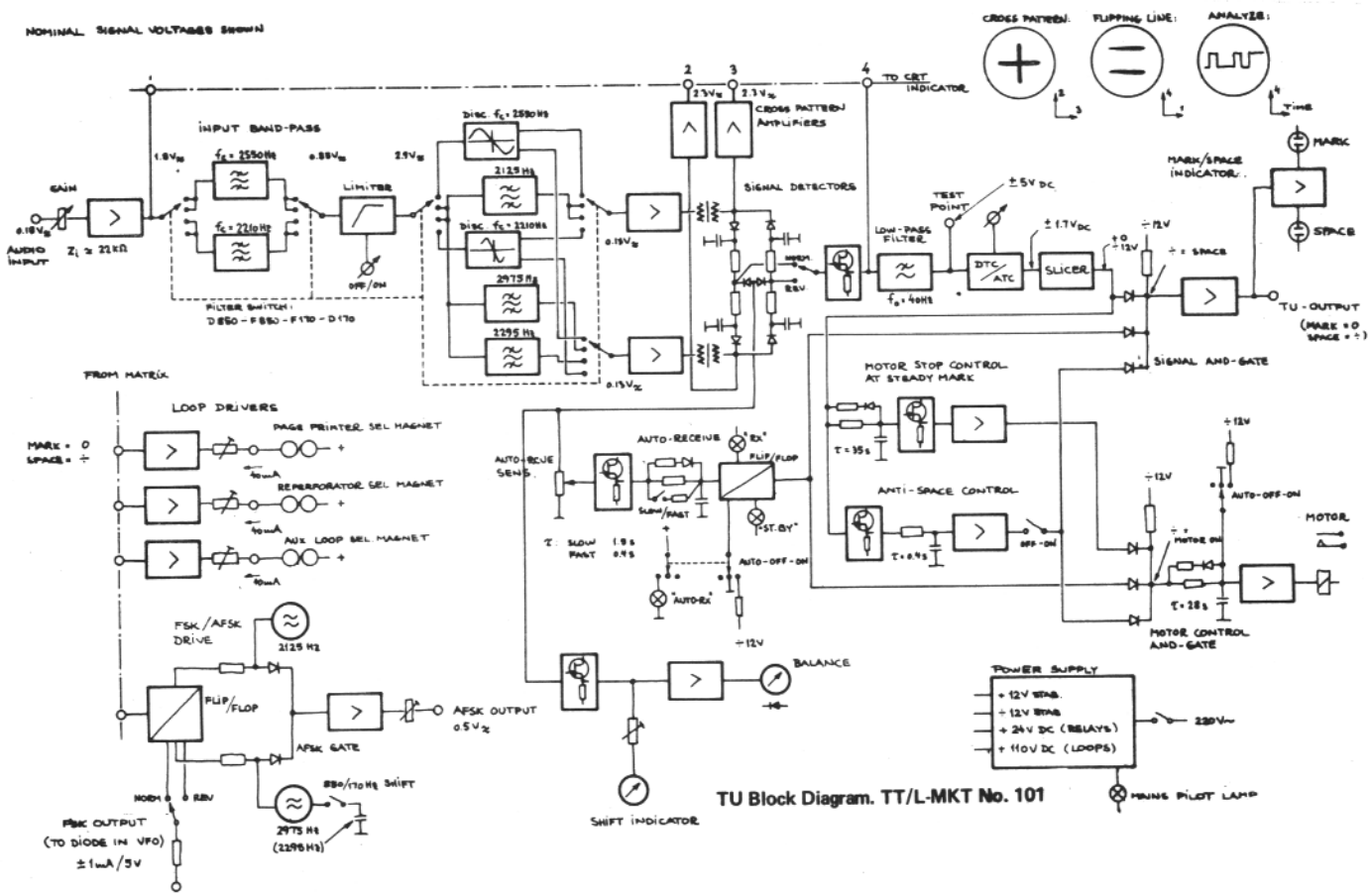
Front Page. Bottom - TT/L-MKT uncased. Interconnecting harnesses are shown.

This page - Top photo - Operating position at OZ60B. Heathkit OS2 oscilliscope rebuilt to match the TT/L MKT (the "Time base Selector" is used as a function switch for; 1. Cross pattern, 2. flipping line switch, 3. analyzer.) TT/L MKT ternimal unit.

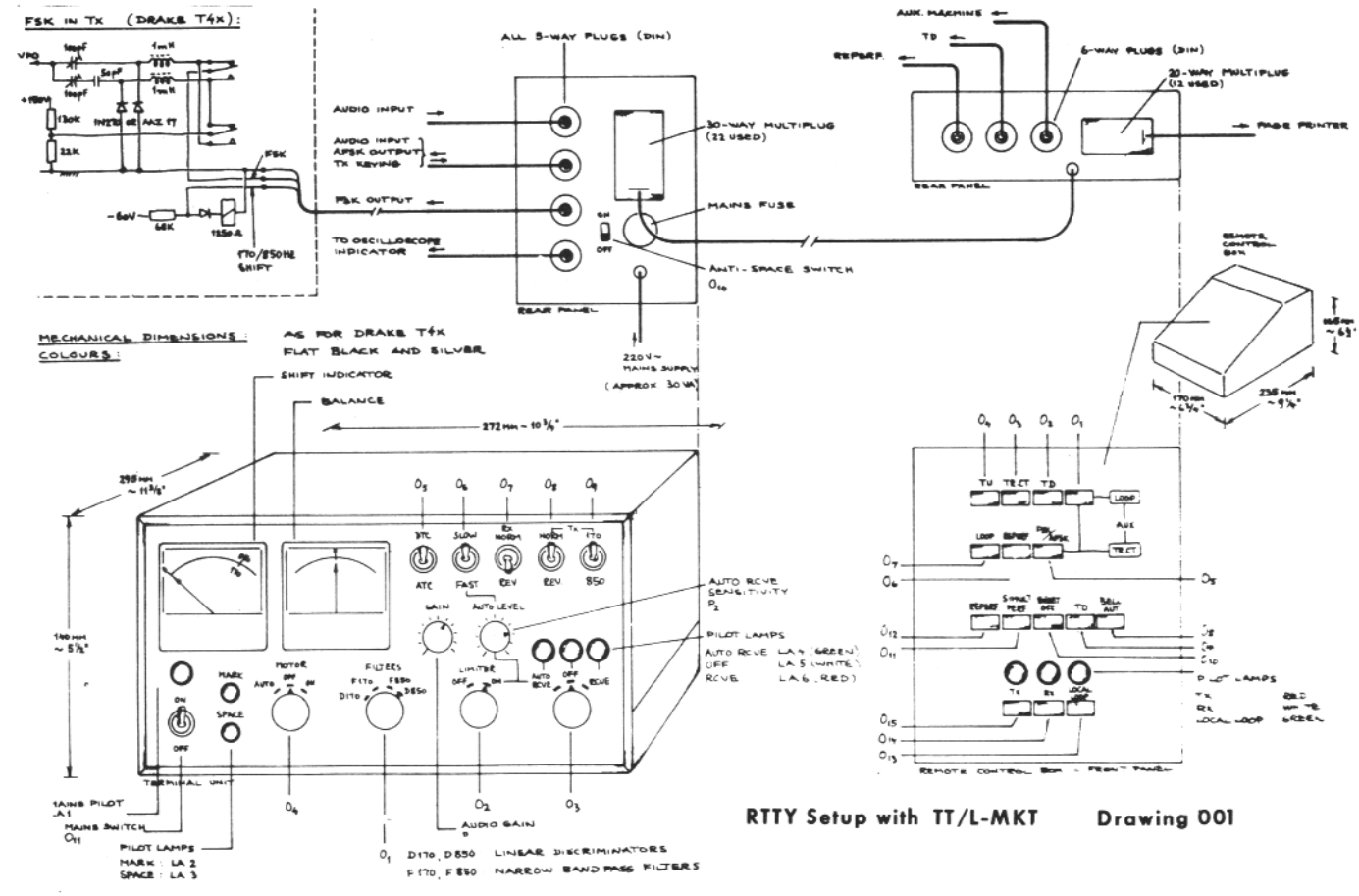
TT/L - 2 terminal unit. (tube version built by author from articles in the RTTY Journal.

Under shelf are controls for 2 meters, radiophone and automatic tape recorder. On table are the Drake TX4 with FSK built in.

This page - Bottom photo - GTN model 5 Teleprinter and remote control box.



TU Block Diagram. TT/L-MKT No. 101



RTTY Setup with TT/L-MKT Drawing 001

RTTY JOURNAL

around the chassis potential (zero volt) 12 volt and 12 volt stablized supply are used. This makes it very obvious to use operational amplifiers (IC's). A very common (and economic) type A709C (Fairchild) is used in the input amplifier, limiter and slicer stages.

Because of the very small size of "a 14 transistor amplifier" a very compact construction has been made around the limiter switch. The op-amp is placed on a small piece of printed wiring mounted directly on the switch. Very short interconnections between the amplifier circuit and the switch give a complete stable circuit in both switchpositions: OFF -10 dB gain and ON - 80 dB gain. (Circuitry: dwg's no. 204 and 306).

The op-amp in the slicer gives a post detector dynamic range of more than 70 dB which secure a good limiterless-narrow band pass filter reception.

The signal and motor AND-gates are modified compared with the TT/L MK2 to match the transistor circuits. The logic voltages are: MARK 0 volt and SPACE ÷10-÷12 volt.

The "magic-eye" indicator in the TT/L MK2 is replaced by two instruments the Shift-Indicator calibrated in Hz-shift when the Balancing Indicator reads minimum deflection (=no difference between Mark and Space signal amplitudes).

The auto-receive circuit uses a flip-flop with small hysteresis as level detector. The flip-flop outputs control the two AND-gates as well as the two lamp-drivers (transistors) for indication.

The motor control has been extended with an automatic stop device for steady mark. Has a steady mark signal been received for more than half a minute the motor will turn off after the normal motor delay time.

A flip-flop with emitter followers in a special arrangement gives symmetrical FSK outpouts which also are used to control the AFSK gate. Two steady operating sine-wave generators determine the AFSK frequencies, - the Space frequency can be selected for wide or narrow AFSK-shift.

High-voltage switch transistors are used in the 110 volt loop drivers. The non-expensive plastic type MJE 340 from Motorola is used. RC-spark suppressors matched to the European 40 mA selector-magnets give a good compromise between current waveform and kick-back voltages. (The last ones will not exceed 200 volts).

The following bandwidths are used in the filter circuit:

Input filters:

850 Hz FSK	B_6 dB	2000 - 3300 Hz
	fc	2550 Hz
170 Hz FSK	B_6 dB	2020 - 2480 Hz
	fc	2210 Hz

Narrow Band pass filters:

f_c = 2125 Hz, 2295 Hz and 2975 Hz

B_3 dB = 85 Hz

B_6 dB = 105 Hz

B_{20} dB = 200 Hz

Discriminators:

850 Hz FSK

top frequencies: 2000 and 3100 Hz

f_{zero} = 2550 Hz

170 Hz FSK

top frequencies: 2070 and 2360 Hz

f_{zero} = 2110 Hz

f_3 dB	34 Hz
f_6 dB	42 Hz
f_{20}dB	85 Hz

As to more detailed description of the TU-circuit it is very much recommended to read the Mainline TT/L MK2 description in RTTY Journal September, 1967 as well as articles about RTTY reception fundamentals written by Irv. Hoff, W6FFC ex K8DKC and Keith Petersen W8SDZ in the same journal, November and December 1964 issues.

All electronics are built on Printed circuit boards of the predrilled and prewired type: "VEROBOARD" (supplied by VERO Electronics Ltd., Chandlers Ford, Hants, England). This type of printed circuit can be delivered in many shapes, - in the present construction a type with 21 lines of copper is used to form a "standard" plug-in board with 21 pole edge connector of the 5007 Varicon-line from ELCO Corp., Willow Grove, Pa. U.S.A. 5 pieces of these plug-in units contain most of the electronics:

#1: AFSK and FSK generator loop drivers.

#2: all control circuits: auto-receive and motor control.

#3: narrow band pass filters and cross pattern amplifiers.

#4: input amplifier and - band pass filters as well as discriminators.

#5: pulse forming circuits: signal detectors, low pass filter, DTC/ATC circuit, slicer and TU-output amplifier with signal AND-gate.

Power supply regulating electronics, limiter and indicator amplifiers are mounted on similar type of P.W. board but not as plug-in units.

Circuit diagrams are shown in dwg's no. 201-202-203-204-205 and 206.

The P.W. boards and all switches, plugs etc. are interconnected by cable harness.

THE REMOTE CONTROL BOX
(circuit diagrams dwg's no. 207 and 208)

In the Control Box matrix and relay circuit are located. All functions are operated with push-buttons, - the main operational modes:

transmitting (TX)
receiving (RX) and
"Local loop" (LL)

are indicated with pilot lamps on the front plate.

The inputs and outputs to the matrix are the following:

TU-output
page-printer keyboard
TD transmitting contacts
Aux. keyboard
page-printer loop drive
reperf loop drive
AFSK/FSK flip-flop
Aux. printer loop-drive

The auxilliary, in and out, are for experimental purposes.

As seen from the wiring diagrams the matrix interconnections are programmed by push button switches and together with the relay circuit only containing three relays with each 4 change-over contacts the following operating possibilities are present:

(The TX-RX and Local loop buttons are spring loaded, all others are of the locked type i.e. every second push will lock the button in its "on" position. None of the buttons have mutual release).

Operating mode	Push Button pressed
1) Receiving	RX (014)

Page printing with possibility for auto-receive automatic. Motor in pageprinter can be controlled by switch 04 on Stand By/Receive mode by function switch 03 on the TU.

When the power is switched on the system will always be in the receiving mode.

2) Local loop LL (013)

If important signals: LTRS - CR - LF are missing in the received message due to QRM these can be supplied to the printer from the keyboard after pressing the LL button. In this mode the UT is automatically switched to the stand by position and the TX mode is blocked. When the missing signals are added the receiving proceeds after pressing the RX button.

3) Transmitting TX (015)

A N.O. contact in relay Re 1 is closed to key the transmitter. The keyboard is connected to the AFSK/FSK flip-flop and the printer will copy the transmitted text. The TU is switched to stand by and the motor control circuit is blocked in a motor-steady-on position (contact c on relay Re 2).

(The TU stand by blocking should be released during RTTY duplex operation i.e. on VHF nets).

Since the RX-TX and LL buttons are spring loaded the modes are indicated with pilot lamps.

4) Reperforating REPERF (012)
received message

By pressing 012 the reperf loop driver is connected to the TU output and the motor relay in the reperf is activated. In the transmitting periods no perforation will take place.

5) Perforating a tape LL (013)
from printer REPERF (012)
keyboard

The LL mode blocks the TU output and the keyboard signals are sent to the reperf via contact c in relay Re 3. If no copying is wanted on the printer pressing of SHEET OFF (010) button will block the printer loop driver.

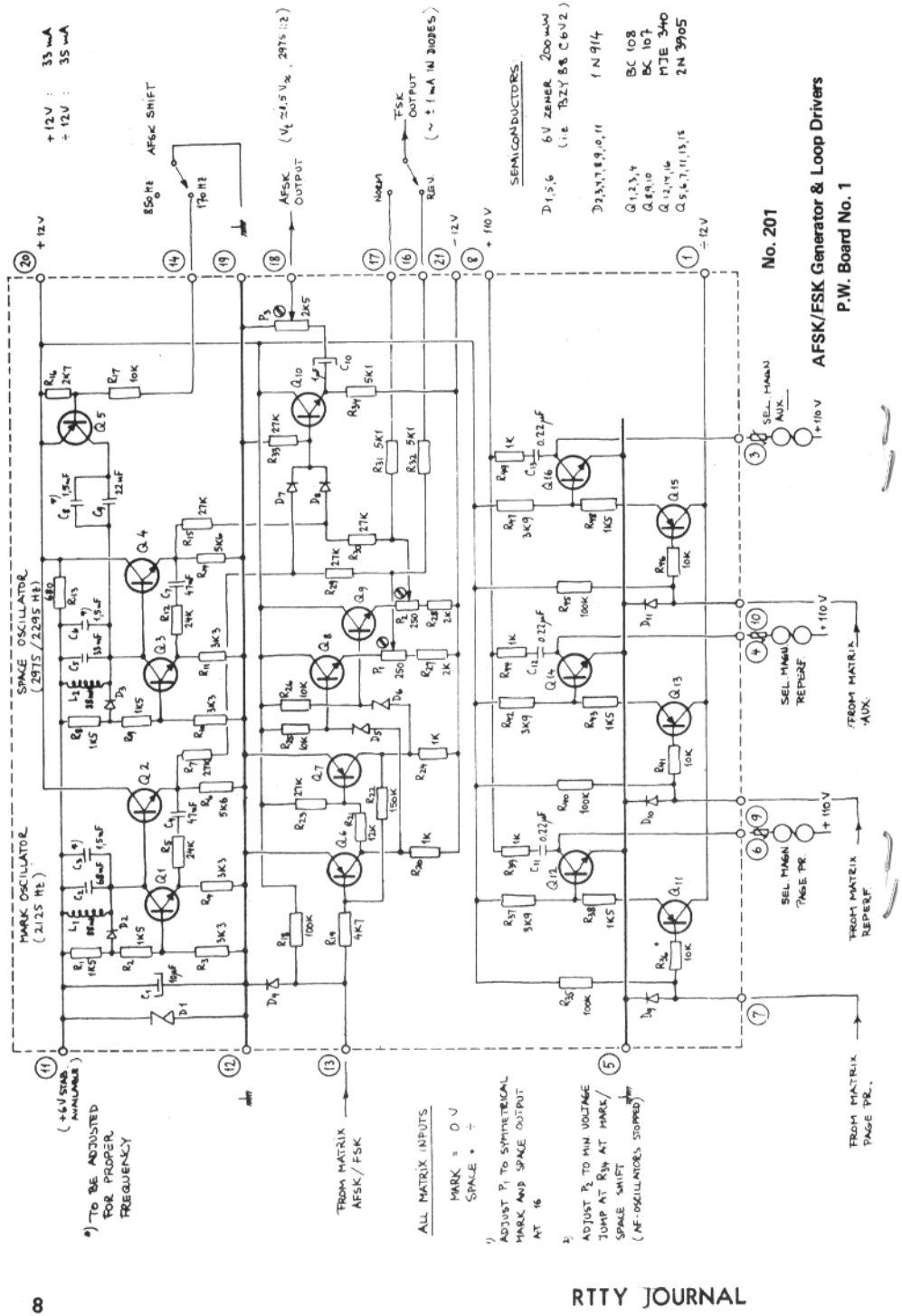
6) Tape transmitting TD (09)

By pressing 09 the TD signals are sent to the AFSK/FSK flip-flop and the TD motor relay is activated. The printer will copy the transmitted text unless the SHEET OFF button is pressed. If the tape in the TD are tightened or run out the transmission can be supplied from the keyboard.

7) Tape TD (09)
duplicating REPERF (012)

The TD operates the reperf loop driver and the tape will be duplicated. The printer will copy unless the SHEET OFF button is pressed.

Continued on page 9



8) Perforating a tape while copying a received message on the printer i.e. preparing the transmission to come — SIMULT. PERF (011)

A connection between keyboard and reperf is established while signalling from TU output to printer loop drive. The following connections are interrupted:

Keyboard to AFSK/FSK flip-flop
Keyboard to printer loop drive
TU-output to reperf loop drive

and prevent normal operation if the TX or LL buttons are pressed.

The prepared tape is loaded in the TD and when the counterpart in the QSO switches to receiving the tape transmission can begin by pressing the "TX" and the "TD" buttons.

Pressing of the 011 button activates the reperf motor relay.

9) No printer copy — SHEEF OFF (010)

Pressing of 010 opens the interconnections:

Keyboard to printer loop drive
TD transmitter contact to printer loop drive.

Used during CQ-transmissions and while sending long tapes (rig descriptions etc).

The printer motor can be turned off manually on the TU (04).

10) Automatic transmit-receive switch system — BELL AUT (08)

In most printers a contacts will close for 30 - 50 millisec. when a BELL-signal is received (and printed).

In the normal use of a teleprinter system where the sending part copies the transmitted text on his own printer a transmitted BELL-signal will be decoded on both sending and receiving printer simultaneously.

This means that the contacts will close for a short while in both machines. When both parts in a QSO have a relay circuit as that of the TT/L MKT both will - with BELL AUT button (09) pressed - change their mode from RX to TX or vice versa.

The transmitting part will only have to close his transmission with a BELL-sign after which the other part immediately can proceed his answering without touching his TX button.

Should for one reason - i.e. QRM - the timing in the TX-RX shift be disturbed correction can be made pressing the manual TX or RX button.

The TT/L MKT has now been in service for some months.. The performance is good and quite comparable with that of the TT/L MK2, which has been used with great success in the past year.

However, the matrix - relay system in the control box make the MKT more comfortable to use in the QSO's.

Even with the three 40 mA loop circuits running on steady MARK the total power consumption is low, - no excessive heat is generated. This makes the TU suitable for 24 hours work on RTTY nets.

The author wishes to thank Jorgen Christensen, OZ2JC who formed the basic ideas in "translating" the TT/L MK2 circuits into solid state ditto.

The balance of this article and the schematics will appear in next months issue (January).

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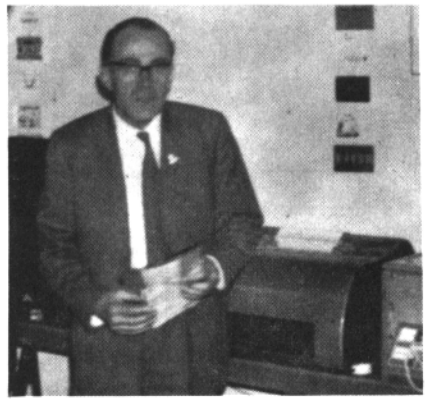
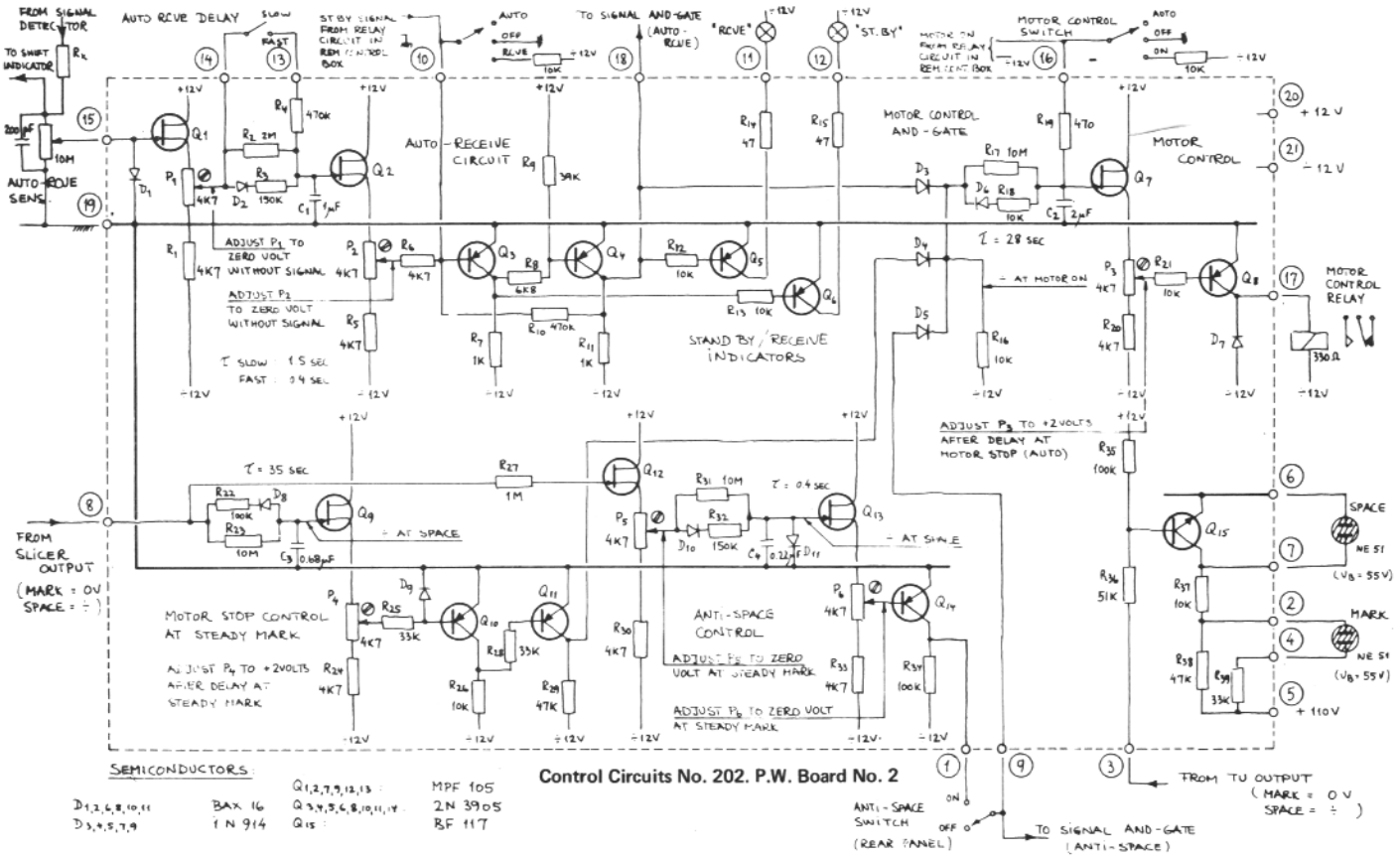


G2FUD
Editor , BARTG NEWSLETTER

****

NEED NEVADA?-

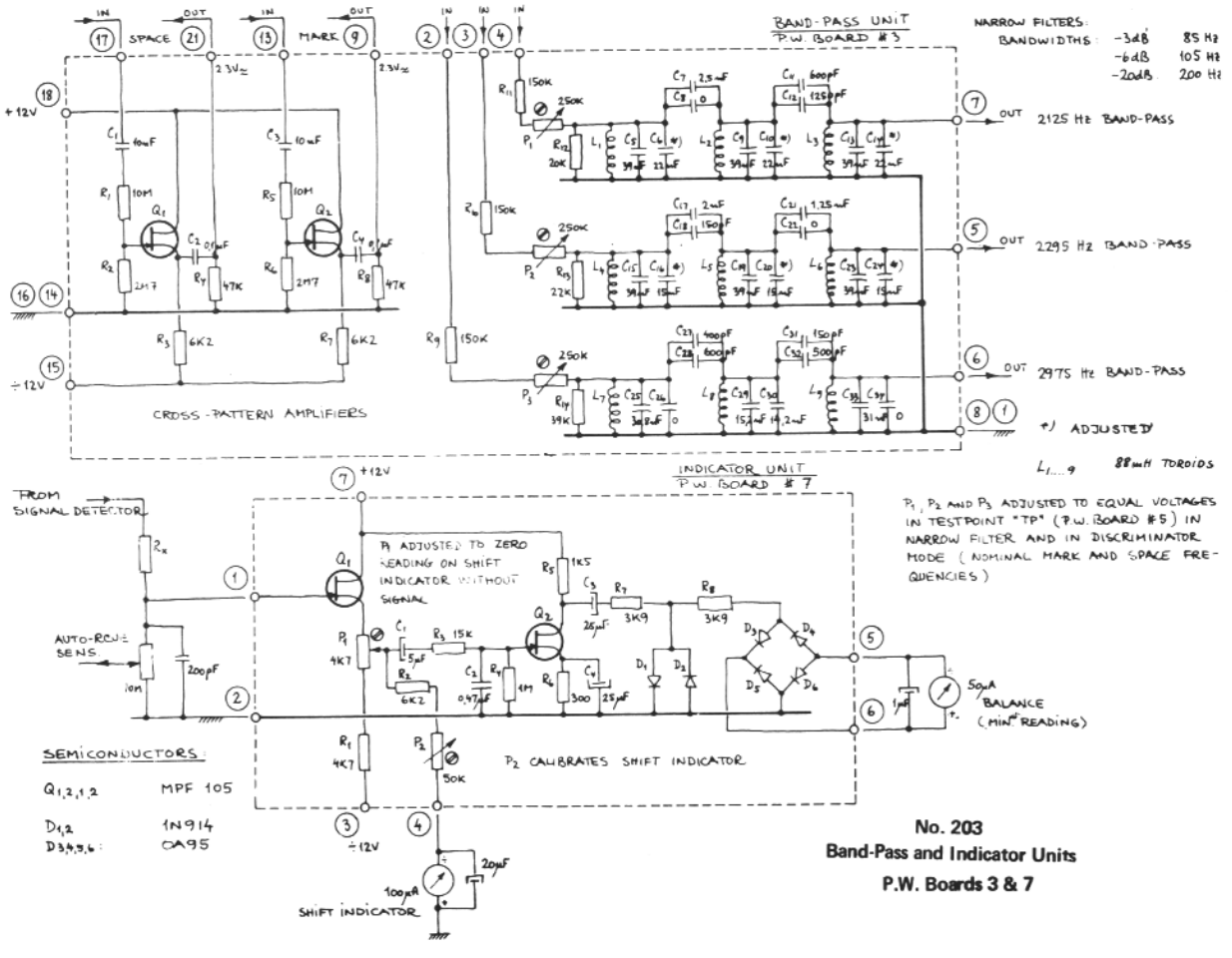
Need Nevada ? Nevada amateur operators have a contest scheduled for week end of December 6 to 8th. Full details will appear in other magazines but most of the RTTY stations have promised to be on during the contest, especially during the odd hours (phone during the even hours). Suggest frequencies of 3620, 7140, 14090, 21100, 29100. QSL cards are guaranteed.



SEMICONDUCTORS:

D1,2,6,8,10,11	BAX 16	Q1,2,7,9,12,13	MPF 105
D3,4,5,7,9	1 N 914	Q3,4,5,6,8,10,11,14	2N 3905
		Q15	BF 117

Control Circuits No. 202. P.W. Board No. 2



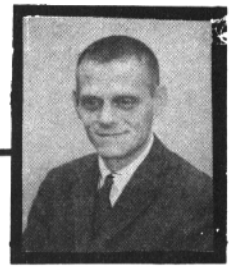
SEMICONDUCTORS:

Q1,2,1,2	MPF 105
D1,2	1N914
D3,4,5,6	OA95

No. 203
Band-Pass and Indicator Units
P.W. Boards 3 & 7

RTTY theory & applications.

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



Part 4 - Fourier Series and Circuits

For the last three months we have been discussing calculations in AC circuits and how to obtain the Fourier Series from a given waveform. This month we will continue the discussion by indicating how a circuit can be solved when a steady-state non-sinusoidal waveform is applied to a linear circuit.

In order to conserve space we are not going to repeat the figures appearing in this "column" last month. We hope the reader will bear with us on this point and will refer to last month's issue at the appropriate points.

Suppose that a RTTY signal is applied to a linear circuit containing just enough energy-storage elements (inductors and/or capacitors) that a transient analysis technique seems to be overpowering. How is the circuit to be solved? Because we used a square wave for our example last month and because we showed (the month before) that a square wave is quite similar to a repeated RTTY character such as the letter "R", we will use a square wave for our discussion.

We have to make several assumptions: 1)The signal (square wave or repeated RTTY character) has been present for a while so that initial turn-on transients have died out. 2)The circuit is linear; i.e., does not contain diodes, and 3)The signal being applied is continuously repeated. Again, although these assumptions seem to be restrictive, many situations and circuits will meet these criteria.

Last month we showed that a square wave can be "decomposed" into a DC voltage and a series of sinusoidal voltages which are harmonically related. The example we used was a square wave having a 130-volt magnitude and a Baud rate of 45.45. This was shown in Figure 1. We found the Fourier series for this wave and said that it could be thought of as a group of generators and a DC source connected in series. The voltages and frequencies of the various sources were shown in Figure 2.

Now, if that square wave were to be applied to a rather complex, but linear, circuit, the circuit could be solved in the following manner: The circuit of Figure 2 is connected to the circuit to be solved. All sources except the DC supply are reduced to zero voltage; this does not mean that anything is disconnected, just that only the DC source will have effect upon the circuit. Find the current flowing by means of ordinary DC circuit techniques; store the answer (write it down). Now, turn off the DC source and turn on one of the AC sources. Any one will do, but in order to keep track of what is going on, turn on the fundamental-frequency source (58.5 V at 22.7 Hz). Find the current flowing due to that source using ordinary AC circuit calculation techniques. Store that answer. Turn off the 22.7 Hz source and turn on the 19.5 V, 68.2 Hz source; solve the circuit for the 68.2 Hz source. Store the answer. Repeat the process for every other source, again one at a time, storing each answer as it is obtained.

Once all the answers have been obtained, simply add them! Probably the best way to add them is to graphically plot each answer (as we did in Figure 3) and then graphically add (again, as we did in Figure 3). The resulting current will have the waveform and magnitude that you plotted.

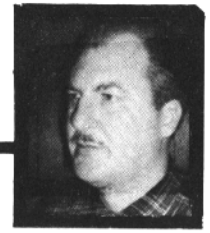
The procedure just described is lengthy but it gives the answer. Also, even though it might even seem overpowering, it is actually a series (no pun) of simple steps. (This is the point where a digital computer comes in handy; they can't really do much, but they are superlative when it comes to doing a series of simple steps over and over.)

This column will not appear in January. In February we will give some VHF RTTY news. In March we will continue this series with actual bandwidth discussions.

73 ES CUL, RG.

RTTY-DX

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



Hello there. . . .

The months seem to fly by at a rapid rate and all of a sudden here we are again. This time it is also the end of the year, and it sure went by in a hurry too. I'm told that being aware of this fact is a sign of old age so we will not discuss it any further. It is difficult to say whether activity on the bands has increased or not this year. A good many new countries became active for the first time and there are many new calls to be heard, however, by the same token you do not hear many of the calls that were quite active a year or so ago so the net gain may be difficult to detect. Twenty meters still carries the burden of the DX activity in spite of the constant clatter of phone stations and commercial intruders. There are literally acres of empty (RTTY) space on Fifteen and Ten but with only intermittent activity. I suppose though, that when one has only limited time to spend at the keyboard one goes where the action is.

On the contest past we do not have too much more to offer. We do wish to thank Bob, WA6WGL and Pierre, XE1YJ for copies of their results and it was appreciated as always. Mr. Murphy not only visited Bob but he decided to stay for the whole week-end and this put a severe crimp in Bob's effort this year. While we do have many scores we have decided to hold them and let the published results tell the whole story. There are some high scores this time, that's for sure.

The latest edition of the BARTG "Newsletter" has announced the availability of a new Award called "World RTTY Champion". It is quite unique and requires no effort on your part to enter aside from participating in the yearly series of RTTY Contests. The winner(s) will be chosen from the published Contest results. The full story appears elsewhere in this issue. Here is a chance for someone to win a handsome Plaque plus lesser awards for the runners-up.

One of the Contests that will count toward the Award is coming up shortly after you receive this issue. The 5th Alexander Volta RTTY Contest on December 6th and 7th. Full rules appeared last month and are the same as in previous years.

Newt, K8QLO, reports that he had a wonderful trip through most of Europe and was delighted to meet some of the fellows he had met many times at the keyboard such as I1ORS, I1CQD, ON4BX, ON4JP, and quite a group of the BARTG boys at the Communications Exhibit in London. While in Budapest he just missed HA5FE, but did have a chat with HA5DD who expressed a keen interest in RTTY. In Vienna he met with Karl, OE1BKW.

Ole, OZ6OB, was in this country on business in mid-October but unfortunately due to the short notice of his schedule and his rapid traveling we missed contact with him.

Pete, I1CTE, will be in the San Francisco area and at Stanford University in the latter part of November. At the same time Bruce, ZL1WB, will be in the same area, San Francisco and Los Angeles, and also Nebraska and Minnesota.

From Uli, Dj9XB, we hear that the Swedish Amateur Radio Society SSA now has a RTTY manager. He is --

Harald Jahnke, SM5AP
Folkungagatan 30
S-753 36 Uppsala, Sweden

All information on Contests, Activity, etc. should be forwarded to Harald and he will see that it gets proper, distribution to the Swedish RTTY boys.

Uli also says that Chris, ZS6BCT has been in Antarctica for some time now, which of course accounts for his absence on the RTTY bands.

Old timer, Bill, VE4BJ writes to say that he has been in contact (ssb) with XT2AA in Upper Volta and that the chap requested a parts book and diagram for a Model 15, which Bill has furnished. He also requested information on TU's. It could be another

exotic call coming up on RTTY from the new African Republics in the near future.

TU2AK has certainly raised a commotion on the band since showing up right after the Contest. Arthur, ON4BX, got Andre to adjust his shift during a QSO and now he is putting out a real beautiful signal. For a while he seemed to have a pipeline directly into Italy as many of the I-1 boys worked him.

A new station has recently become active in Belgium. Rene, ON4JP, is on with a Drake TR-4 into a beam and using a Model 19 machine. He puts in an excellent signal here on the East Coast. Incidentally, Rene is the Chief of Police of the city of Bracquegnies.

From Bud, W2LFL, comes news that I1EVK has been in RTTY QSO with ET3ZU, in Asmara, Ethiopia for a new country and a real rare one too. Bud's station along with that of another RTTY'er, I1AFF were featured in a story appearing in the Italian magazine I1 Cavour. The title of the article was "I1AFF chiama (calling) W2LFL".

As Bud points out, you have to be careful when you QSO either HA5KFB or HA5KBF as you have a tendency to think you have worked before or misprinted. Not so, as they are two different stations. I found this out in the contest and was sure we had a previous QSO. It took twenty minutes to get it straightened out!

There has been periodic activity from Guam with Norm and sometimes Al at the keyboard at KG6AAY. The best time is around 11-1200z here on the East Coast.

Venkat, VU2KV, has been quite consistent mornings and evenings but he will be traveling again shortly and may be away for a few months. Ven says that the dxpedition to the Maldives by 4S7WA has been postponed until the end of November. Hopefully, about now!

Mike, F3PI, has been heard sending tape to FP8CY on St. Pierre so we assume that Yvon is receiving only at the moment. No further info at this time however.

Charlie, W5QCH, unfortunately just missed the Contest but he is now back on after being QRT for a few months. He has a tremendous signal from a three element Quad at his new QTH at Seabrook Texas, near Houston. He is also putting up longwires in some adjacent fields so watch for Charlie in the coming Contests.

ON4BX reports a QSO with KR6MD on 14055 khz and I recently had a one with KR6MH on 14065 khz. This is a bit off the beaten track and you would not normally find them unless you were operating. CW. These are Club stations at Marine Corps Bases over there and the ops at the time were not too familiar with RTTY operation in the hams bands. At least this was so in the case of 6MH. So you never know what you'll find if you tune around a bit.

As mentioned in previous issues, the RTTY-DX HONOR ROLL will appear in the January issue. Many thanks for the updating of totals already received and we take this opportunity to ask all once more to please have their new totals to me by the end of November. Those who have been inactive for the past year will be deleted with this posting.

With the year ending it would be remiss of me not to make a special note of the contributions you have made in the past twelve months that have made this column possible. Though it is not always possible to thank each one individually, we do sincerely thank all of you for the information you have furnished for the benefit of us all in the hunting of RTTY-DX.

Happy Holidays,
73 de John

---renew now---

RTTY Contest Calendar

Volta DX Contest - Dec. 6-7, 1969
Rules in last months issue

DARA WAE RTTY Contest - last week end of April 1970

1ST WORLD RTTY CHAMPIONSHIP

The Committees of several RTTY Group and Societies have come to the decision to make an Award to the "WORLD CHAMPION OF RTTY".

The objects of this Award are as follows:

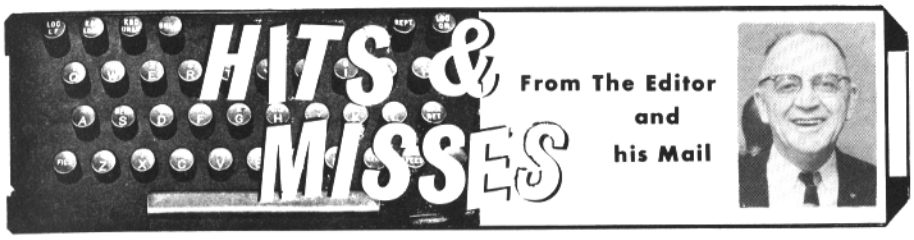
1) To promote greater interest for the RTTYer taking part in the various RTTY Contest.
2) To increase the competitive spirit during the course of the Contests during the year.
3) To make available an Award to the Radio Amateur who has demonstrated his ability to operate RTTY during a period of one year.

Full details in next issue.

---renew now---

BROAD MINDED

USE NARROW SHIFT



PLEASE - You are reading the December issue and about half of our subscriptions expire with this issue. Check your address stencil, if the date is Dec. 9 this is your last copy on your present subscription. If you plan to renew PLEASE do it now. Next month is a busy one for us (before Christmas is for everyone) and an early renewal will assure you receiving the January issue on time. Early renewals will be taken care of but if not received by publishing time it will probably be a month before we can reinstate late renewals and get our records up to date. Please check it NOW. Mention RENEWAL when sending renewal.

---renew now---

One more thing -- we get a number of two and three year subscriptions and in most cases have returned the third year. This is contrary to most magazines where multiple year subscriptions are welcomed and we admit that many times it is more convenient to pay in advance and not be worried about sending a check each year. Unfortunately, so far, the Journal is a one man operation and can be subject to sickness and any number of other things to halt publication. We keep a reserve for all subscriptions but would prefer not to be obligated for more than one year at a time. We hope you understand.

---renew now---

"Arrangements have been made with NCARTS officials to provide a one year's subscription to RTTY JOURNAL to those people buying "mouse" 28KSR machines recently. This will commence with the January 1970 issue. If you are already a subscriber, do not send in dues for 1970, your subscription shall be automatically extended for one year."

---renew now---

Post office efficiency! ! ! We can mail one RTTY Binder anyplace in the country for 32¢. Two of them tied together cost about a buck. This is why we mail an order for two or more separately.

After our little cry last month for articles and pictures our tears were dried even before the magazine was mailed. Several good articles and some of the shorties we need so badly arrived along with some pictures. But keep them coming, it doesn't take long to use them up.

Crys and the editor are taking off for a week in Florida right after this issue is mailed although the mail will be picked up we won't see it for a week. Hence no replies to any questions.

---renew now---

A few Model 28 Teletype machines have been obtained in Italy. Only trouble is finding a "28 model governed motor". If anyone has one or knows where one or more can be found please contact K8QLO or the Journal and we will forward the information.

---renew now---

BACK ISSUES —

The ONLY back issues available are: July through December 1966 - February 1968 to date. (July-August is combined issue.) Copies are 30¢ each. The TT/L-2 reprint is 30¢. RTTY JOURNAL binders are $2.50 each in the USA and $3.00 in Canada.

RTTY JOURNAL
P.O. Box 837 Royal Oak, Mich. 48068
"Dusty" Dunn — W8CQ
Editor & Publisher

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Homebrew Paper Winder

Bill SHERWOOD, W6FBY

PAPER WINDER FOR USE ON UNATTENDED AUTOSTART

When your machine has been printing all weekend, and there is paper piled on the floor, did you ever wish you had a paper winder? Here is an easy solution, a handfull of parts, a few hours of time and PRESTO, paper winder.

Needed:

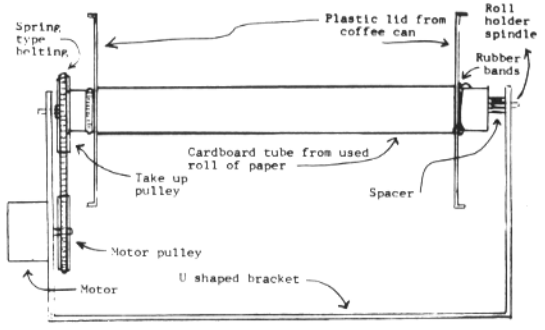
Paper roll holder shaft, salvaged from model 15 or 19. Display motor, or barbeque motor. Available from Olsen Radio, induction motor with gears, speed not important, anything from 2 to 12 RPM is ok. 2 pulleys, available from salvaged movie projector or Hobby shop, 1 to 2 inches in diameter. Approximately 12 inches of spring type belting, available from the salvaged movie projector, or can be purchased at your nearest camera repair shop. If purchased at the repair shop, be sure to get the couplings that fasten the spring belt together. U shaped bracket (you will have to make this one) to hold the paper takeup spool, and the motor. 2 plastic lids from 2 pound coffee cans.

How to make it:

Eyball several pulleys and try to estimate what size on the motor and what size on the takeup spool will end up giving you approximately 4 RPM takeup motion. The exact speed is not very important. Drill out the center of the motor pulley to fit over the motor shaft. Drill out the center of the takeup spool pulley to fit over the takeup spool shaft. Fasten both pulleys with the set screws that come with them, to the proper shafts. The U bracket should be formed with a width that allows the takeup spool spindles to go through holes you will drill near the top of the bracket. The spindle on the motor side will protrude through the pulley, allowing the takeup spool to be mounted by flexing the sides of the bracket outward and letting it spring back with the two spindles in the matching holes. The motor is mounted on the side of the bracket that has the pulley mounted to the takeup spool. Align the two pulleys so that the belt will run vertically from one pulley to the others. Make up a spring type belt just a little shorter than the real distance around both pulleys. Be careful that the final rotation of the takeup spool allows the paper when being wound to go over the top, and not under it. Cut holes in the center of the coffee can lids, the same size as the wooden part of the take up spool. One lid is held in place by the cardboard center tube pressing against the wire spring on one end of the spool. The other lid is held in place by several rubber bands. These lids keep the paper winding up neatly, acting as end pieces for the paper.

How it works:

With the motor, in parallel with the printer motor, the winder starts when the printer motor starts. If there is no paper to wind, the belt merely slips. When there is paper coming out of the printer, the winder will take it up.



CLASSIFIED ADS Rates $1. 30 words - Additional words 2¢ ea Closing date 1st of month.

NO GLARE WINDOWS for Model 15 & 19 Printers. Cadinum plated & Gold iridite finish. $12.50 P.P. Check or M.O. Bud WA6UEF, 17114 Sunderland Dr., Granada Hills, Calif. 91344.

RTTY GEAR For Sale; List Issued monthly. 88 or 44 mh toroids - 5 for $2.50 postpaid. Elliott Buchanan and Associates. 1067 Mandana Blvd., Oakland, Calif. 94610

TYPEWRITER RIBBON REINKER, Hand operated model now only $3.00. 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.

VECTOR C12 PLUG IN UNITS, octal, alum case 3" high, 2" square. Ideal for RTTY filters. New, 75¢ each. Howard Fasold, WAOVQM, 138 Palisade Cir.. Manitou Springs, Col. 80829

LET J & J CUSTOM BUILD you a Mainliner TT/L2 FSK demodulator exactly as described in the May issue of QST with sharp filters for 850 and 170 shift tuned and adjusted in your unit for excellent performance. Also available TT/L2 filters. J & J Electronics, Canterbury, Conn. 06331

FOR SALE 3 CHANNEL TD type mxd, Model 14 typing reperf, Model 28 typing reperf with matching reader. This combination comes as one unit allowing you to read the last character punched. Also has gear box for speeds to 100 wpm. Model 26 printer. Consider trade for good TU, linear, Tektronix scope. KØJBD, P.O. Box 3687, Des Moines, Iowa. 50322

KEYBOARD; WITH AUTOMATIC Here-is answer back unit for the model 15 or 19 teletype machines. This is device which when tripped will send a pre-coded signal up to 21 characters operated from the keyboard. You can code in your call, name or whatever you desire. Complete, excellent $12 ea. Model 15 teletype machines, send receive, complete with sync motor, cover, and keyboard, excellent $55 ea. With automatic Here-is answer back keyboard $62.50 ea. Send for catalogue. Atlantic Surplus Sales, 300 7th St., Brooklyn, N.Y. 11215.

TELETYPE TEST SET I-193C. Ideal source of perfect teletype elements for testing keyers, T.U.'s, etc. More accurate than keyboard. See RTTY Journal, April, 1965; September, 1967. Cost U.S. Gov't. over $600.00. Reconditioned, like new. $14.95, F.O.B. Harrisburg, Pa. Telemethods International, Box 18161, Cleveland, Ohio 44118.

AK-1 AFSK GENERATOR complete with power supply, wired and tested in A1-Cab deluxe cabinet, 8 1/2 x 6 1/8 x 5. J & J Electronics, Canterbury, Conn. 06331.

PARTS - ALL MACHINES - fast service on all machines from 14s thru 35s. SASE for list. Sell Fred your surplus TTY for highest cash or trade. Typetronics, Box 8873, Ft. Lauderdale, Fla. 33310 W4NYF

SALE 852B FRONT PANEL for model 32KSR teletypewriter, complete with push button switch, relay, resistors, Jones plug etc. excellent $3.50 ea. Also 852A front panel for 32ASR complete with push button switch and on - off switch, three relays resistors, jones plug etc. excellent $4.50 ea. Reader; high speed, tape, Ferranti model Markll, excellent $65. ea. Atlantic Surplus, 300 7th St. Brooklyn, N.Y. 11215.

TOROID COILS 88 mh, uncased, postpaid, 5 for $2.00. LaVon Zachry, PO Box 845, Apple Valley, Calif. 92307

TOROIDS 88 or 44 mhy. center tapped, never potted, 5/$2.00 postpaid. 11/16th oiled Fresh reperferator tape $3. box/10. Model 32KSR complete $200. German Model 15KSR with table $75. Model 15 with tape punch and TD, Table, complete $120. (Just like model 19 set but only size of a 15 printer). Gears for most speeds, most machines $6. a set. postpaid. Polar relays $3. Sockets $1. Drake 2B & 2BQ $175. New Clegg 66er $160. GE portables and mobiles - write. Wanted Ham-M rotator, Bird Thruline watt meter and elements. Stamp for list. Van, W2DLT, 302R Passaic Ave. Stirling, N.J. 07980

SAROC NEW QTH Stardust Hotel new QTR February 4-8, 1970. Cocktail parties hosted by Ham Radio Magazine. SWAN and GALAXY. Additional information and Stardust Hotel special SAROC room rate card QSP SASE SAROC, Box 73 Boulder City, Nevada 89005.

FOR SALE: 19ASR, like-new. Exceptional. Auto CR-LF and non-overline. $100, includes steel table, regulated power supply, TD. $100. I.M. Hoff W6FFC, 12130 Foothill Lane, Los Altos Hills, Calif. 94022

WANTED: MANUAL for Frederick model 1200 demodulator. Will buy or borrow for copying. W8FEU Ron. Renaud, 9150 Texas Ct., Livonia, Michigan 48150

MODEL 32KSR; teletypewriter, send - receive, with console, and Here-is answer back keyboard to set up identification, 21 characters, operating condition, excellent $180. ea. Atlantic Surplus Sales, 300 7th St., Brooklyn, N.Y. 11215.

SURPLUS MACHINES from Michigan Bell many parts and 60 WPM gears, Type pallets and keys. Machines must be picked up. Fay Wilson, WA8KJH, 409 Nottingham Dr. Brooklyn. Mich. 49230.

ADDITIONAL CLASSIFIED on NEXT PAGE