ADDITIONAL CLASSFIED

FOR SALE; KLEINSCHMIDT ASR Model TT269FG and 179FGG combination mounted on table with 15 rolls 7/8th perf tape, 60-75-100 speed gears plus manual for above. You ship, $175.00. Dave Gould, 4230 Jade N.E., Salem, OR. 97303 WA7JMG.

FOR SALE; ST-3 Newly built TU. 3 1/2" rack mounting. $95. Assembled and Tested AK-1 AFSK osc. boards, $25.00. Vern Schroeder, K9POU, 607 Pinest Rd., Batavia, IL. 60510

FOR SALE; "34" KSR, 28 ASR, KSR, ROTR with gear shift, LPR (1 and 2 shift) LPE, LRPE, LTPE, Stunt boxes coded. Many modification kits available. Write specifying your needs. P. Anderson, 2448 N. Wilson, Royal Oak, MI. 48073.

WANTED; PARTS AND INFORMATION for an Acme facsimile machine. Edward Radtke, 1602 Woodluck Ave. Louisville, KT. 40205. WA4BQE.

TECHNICAL ADVICE OR INFORMATION Would be appreciated in putting the Heath HW16 cw transceiver on RTTY, particularly interested in autostart net operation. Please contact Al Whitehead, VE3GNN, 21 John St. Chatham, Ontario, Canada.

SELL MISCELLANEOUS BACK ISSUES RTTY to 1953. SASE for list. Want RTTY for 1967. Also want Transactions of various Professional Groups of IEEE. Nagle, 12330 Lawyers, Herndon, VA. 22070.

SELL - M-15 PRINTER, FPR-23 Non-Typing Reperf, M-14 TD. New Grey Wrinkle paint and perfect condx. $75.00. Northern Radio FSK, Model-4 (Type 105) $25.00. You pay shipping. G. Rose, 221 No. "W" St., Lompoc, Calif. 93436.

MODEL 28 KSR MK III IN EXCELLENT CONDITION. Clean inside and out. Mechanically and Electrically perfect. $250.00. Call Mark Hammond 801-561-4430. 438 Roosevelt Street, Midvale, Utah 84047.

HAL COMMUNICATIONS CORP. will display THE line of RTTY equipment at Dayton and other major shows. Phone your orders for pickup at the show. HAL Communications Corp., Box 365RJ, Urbana, IL 61801 Phone 217-359-7373.

****

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

FIRST CLASS MAIL

RECEIVED FEB 22 1974

RTTY JOURNAL

March 1974

EXCLUSIVELY AMATEUR RADIO TELETYPE

VOLUME 22 No. 3 **30 Cents**

PHOTO OF THE SWISS CLUB STATION, HB9AK, DURING THE C.A.R.T.G CONTEST- USING VIDEO PRINT-OUT. Left to right- Giovani, HE9HXE, Reinhold, HB9MDD, Heintz, HB9ATV, Carl, HB9P, Jurg, HB9MIY..

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RESULTS- C.A.R.T.G. DX Sweepstakes 1973-

The "Lucky 13th" RTTY DX World-Wide Sweepstakes, 1973, sponsored by the Canadian Amateur Radio Teletype Group (C.A.R.T.G.) was again a very successful event, though by world-wide reports received the indication is that propagation was definitely not up to the standard previously enjoyed in our former contests. However, participation was good -- 121 Logs received, 50 countries contacted.

The shift used almost exclusively 170 cps. and the shorter contest hours - 30 - was popular, some suggesting even more reduction for future contests. Fifteen "Green RTTYers" sent in Logs. 41 claimed WAC, and on the distaff side I1PXC - Rosa Maria Columbina turned in a very creditable score.

A list of contestants and scores follow.

For complete contest summary and statistic report, send SAE to "C.A.R.T.G." at 85 Fifeshire Road, Willowdale, Ontario, Canada M2L 2G9.

AWARDS **October 13 -15th, 1973**

1. LU2ESB Argentina 3,001,128
   Plaque - "C.A.R.T.G."
2. KG4AA Guantanamo Bay 1,503,940
   Plaque - "RTTY JOURNAL"
3. I5KG Italy 1,313,980
   Plaque - "C.A.R.T.G."
4. I1BAY Italy 1,266,430
   Plaque - "RTTY JOURNAL"
5. JA1BK Japan 1,198,776
   Plaque - "C.A.R.T.G."
6. KZ5BH Canal Zone 1,172,525
   Plaque - "A Group Member"
7. WA2YVK U.S.A. 1,100,208
   Plaque - "RTTY JOURNAL"
8. KH5AG Hawaii 997,092
   Plaque - "C.A.R.T.G."
9. W2LFL U.S.A. 965,352
   Plaque - "RTTY JOURNAL"
10. W4YG U.S.A. 921,040
    Plaque - "C.A.R.T.G."
11. WA2YVK U.S.A. 1,100,208
    Gold Medallion & Ribbon "RTTY JOURNAL" High Score U.S.A.
12. VE7UBC Canada 561,302
    Gold Medallion & Ribbon - Canadian Director ARRL Award High Score for Canadians.
13. W4YG U.S.A. - 22 Canadian Contacts - Silver Medallion
    KZ5BH Canal Zone - 22 Canadian Contacts Silver Medallion
14. VP2KH St. Kitts 385,865
    Plaque, Green RTTYer Sidney Burnett Memorial
15. LU2ESB Argentina 82,240
    Silver Medallion & Ribbon 10 Meter Operation "RTTY JOURNAL"
16. OZ4FF Denmark - 40 Contacts on 80 M. Silver Medallion "C.A.R.T.G."
17. Peter Boer NL687 Holland 790,930 Plaque - "C.A.R.T.G." SWL Printer High Score.
18. I5CLC Italy 695,500
    Low Power Operation Silver Medallion & Ribbon "RTTY JOURNAL"
19. 4U1ITU Geneva 689,216
    Plaque - "C.A.R.T.G." Multi-Operated Station
20. Certificates to be issued to the top scores in each U.S.A. and Canadian District, and each Country.

SWL Printer

1.	Peter Boer NL687	Holland	790,930
2.	Paul Menadier	U.S.A.	499,900
3.	Sandy Morton	Scotland	408,795
4.	Walter G. Meier	Switzerland	233,890
5.	Alberto Marchesini	Italy	154,860
6.	Giarnello Roberto	Italy	104,300
7.	Fred Himes WN8OUT	U.S.A.	

1.	LU2ESB	3,001,128	54.	VK5IF	172,580
2.	KG4AA	1,503,940	55.	WØNP	167,220
3.	I5KG	1,313,980	56.	G6JF	157,060
4.	I1BAY	1,266,430	57.	W8CQ	137,975
5.	JA1BK	1,198,776	58.	VE5TO	121,800
6.	KZ5BH	1,172,525	59.	SMØOY	110,425
7.	WA2YVK	1,100,208	60.	KZ5NG	101,275
8.	KH6AG	997,092	61.	WØITU	91,517
9.	W2LFL	965,352	62.	HB9HK	74,712
10.	W4YG	921,040	63.	DK3MG	74,435
11.	OZ4FF	902,020	64.	SMØACY	73,632
12.	W4CQI	884,930	65.	W7RGL	73,418
13.	CE3EX	874,104	66.	K7BVT	71,350
14.	W1GKJ	791,400	67.	OE5OEL	68,250
15.	DL2AK	718,290	68.	K4GMH	67,844
16.	I5CLC	695,500	69.	YJ8JS	67,400
17.	W8JIN	633,428	70.	VE1RB	58,516
18.	JA1ACB	632,932	71.	W4AIS	56,963
19.	I6NO	581,290	72.	WB4RUA	52,200
20.	VE7UBC	561,302	73.	VE5DO	51,408
21.	W3KV	533,968	74.	SM5BKA	50,300
22.	WAØTLT	529,216	75.	PY6HL	42,030
23.	ON5WG	513,316	76.	OZ9JB	34,955
24.	K5ARH	477,088	77.	DK3NH	29,860
25.	PY2CYK	463,820	78.	W6AEE	27,530
26.	DLØAK	400,300	79.	VO1EE	25,164
27.	VP2KH	385,865	80.	DL1VR	24,192
28.	VK2KM	382,765	81.	VK2EG	21,792
29.	W1KJL	382,500	82.	DK1AQ	19,152
30.	W6BCT	366,974	83.	VE4SC	14,223
31.	K6WZ	365,260	84.	HA5FE	14,190
32.	XE1YJ	357,075	85.	UA9PP	13,450
33.	W9KDX	351,760	86.	SL5AR	11,760
34.	ON4CK	332,960	87.	**SM6EDH**	**10,388**
35.	IT1ZWS	326,520	88.	W8CAT	9,460
36.	PY1DCB	326,180	89.	EI5BH	8,652
37.	VE3IR	319,185	90.	VE2AXO	7,448
38.	PAØGKO	307,136	91.	VE7BDQ	7,340
39.	WØHAH	287,936	92.	K2RYI	4,059
40.	W5EUN	263,280	93.	LA4YF	3,922
41.	HB9AVK	260,720	94.	JA8ADQ	3,664
42.	WAØTJR	252,620	95.	OZ4EDR	3,210
43.	PAØSCH	242,640	96.	SM6AEN	3,162
44.	W3EKT	232,600	97.	VE5SC	2,563
45.	FO8BO	232,552	98.	VE7AFJ	1,720
46.	W6JOX	231,040	99.	I2SVA	1,566
47.	W3DJZ	230,130	100.	EA3VF	990
48.	JH1TFF	223,404	101.	VK6KR	894
49.	W5CEG	215,940	102.	W8TCO	560
50.	JH1ISF	198,630	103.	G3RDG	273
51.	WØMT	192,666	104.	OZ4XR	198
52.	I1PXC	186,480	105.	SM4CMG	64
53.	VK3KF	183,480			

Multi-Operator Stations

1.	4U1ITU	689,216
2.	HB9AK	259,508
3.	OZ7RD	58,440
4.	SM4BKD	14,688

*****

Modern AFSK Oscillator - -

DONALD KELLEY, WAØTJR
1490 Yaqui Drive
FLORISSANT, MO. 63031

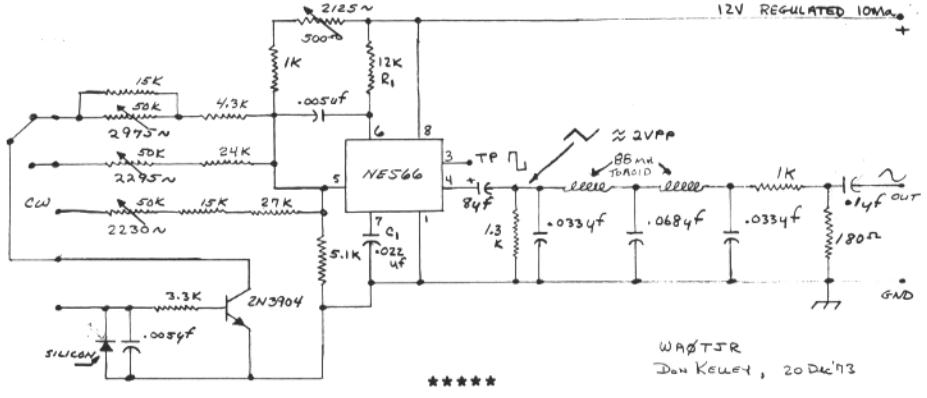
My quest for a simple reliable and inexpensive AFSK was solved by the discovery of the Signetics function generator -- the NE 566. The first use of this integrated circuit as an AFSK was detailed by K7ZOF in Ham Radio of March '73. After reading his article and the Signetics application notes, I decided to design my own with the circuit results shown.

This unit costs about $10 to build. It produces stable sine wave outputs for the purest, but the filter can be removed if a triangle modulation waveshape is acceptable. Total current consumption is 10 ma at 12 volts. The total part count is 29 versus 54 in the AK-1. The reliability of the unit has been fine. After a months useage (I leave my transistor gear on 24 hours a day 7 days a week) there was no shift in frequency.

The NE566 is a voltage controlled oscillator. The basic frequency is set by R1 and C1 and then modulated (FSK'd) by shifting the voltage on pin 5. A well regulated source of voltage is essential. One of the three terminal regulator IC's will handle both the TU and the AFSK.

The parts are those in my junk-box. None are critical. The filter needs 1.2K terminations and there is no difference between mark and space tone amplitudes at the output. The resistance ratio was chosen to match the output of my Heath mike. All resistors are 1/2 watt carbons since they carry nill current. The pots are single turn cheapies and you can hit the frequencies on the nose with the values shown. The 2N3904 needs plus 12 on space and plus 2 or so on mark.

Because of its simplicity and reliability, I've dubbed the unit, the AK-2. You will recognize the filter as coming directly from Hoff's unit so there is a carry over from the AK-1.



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B.A.R.T.G. Spring DX RTTY Contest-

WHEN.
0200 GMT Saturday March 23rd until 0200 GMT Monday March 25th 1974.
The total **Contest** period is 48 hours but not more than 36 hours of operation is permitted. Times spent in listening count as operating time. The 12 hour non operating period can be taken at any time during the Contest, but off periods may not be less than 2 hours at a time. Times on and off the air must be summarized on the Log and Score sheets. The Contest is also open to Short Wave Listeners.

BANDS.
3.5, 7.0, 14, 21 and 28 Mhz. Amateur Bands.

STATIONS.
Stations may not be contacted more than once in any one Band, but additional contacts may be made with the same Station if a different Band is used.

COUNTRY STATUS.
ARRL Countries List, except that KL7, KH6 and VO to be considered as separate Countries.

MESSAGES.
Messages exchanged will consist of:
(A) Time GMT.
(B) Message Number and RST.

POINTS.
(A) all two-way RTTY contacts with Stations within one's own Country will earn **TWO** points.
(B) all two-way RTTY contacts with Stations outside one's own Country will earn **TEN** points.
(C) all Stations will receive a bonus of **200** points

CONTINUED ON PAGE 11

Using the Heathkit HO-10 and SB610 as an RTTY Monitor Scope-

ROBERT CLARK, WA4VYL
823 Jones Avenue
MARYVILLE, TN. 37801

Any RTTY enthusiast who has tried to use either the HO-10 or SB-610 with the ST series of terminal units (1) has been quite disappointed. Both of these scopes offer too little gain for a good display with the one megohn isolation resistors in the TU discriminator. These resistors prevent external cables (and scope) from loading the discriminator and also provide some filtering to clean up the display.

One solution that has been used is to build a pair of amplifiers into the TU. This is a good solution and relatively simple, however I have three TU's and only one scope devoted to RTTY monitoring. The obvious answer is to include the amplifiers in the scope rather than the TU. The scope however does not have the voltages necessary for a solid state amplifier nor the room for an additional tube. There is a tube in the unit (Both HO-10 and SB-610) which is never used at this station and is probably seldom used elsewhere. The two-tone generator uses a 6J11, dual pentode, to generate the tones. It is possible to use this oscillator stage as an amplifier with a minimum of additional parts and expense. The stage supplies additional gain and isolation. The display is nearly as good as that of my lab scope and the lab scope has been returned to the lab.

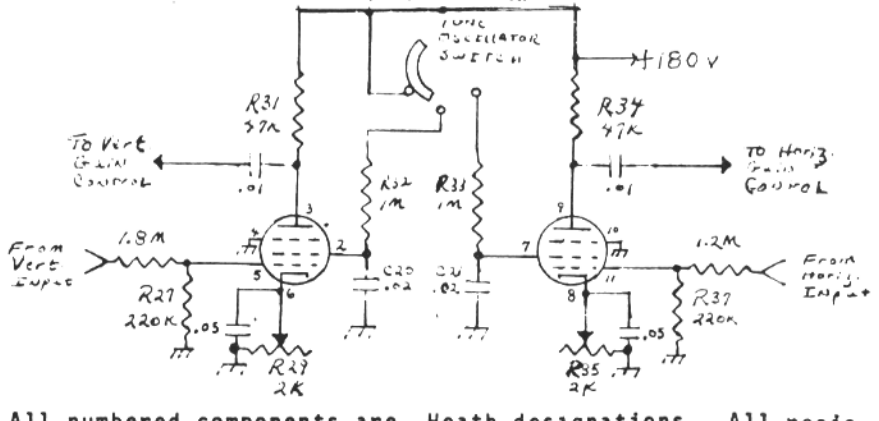
One of the objectives of this modification was to minimize the changes to the unit. Wherever possible, the original components have been retained. The PEC networks were removed as well as all components wired to the grid and cathode of each of the two tube sections. The potentiometers which were used to set the tone levels are used to set the cathode bias. The only components added were four resistors (grid) and four capacitors (cathode by-pass and plate coupling). The original wiring of the tone oscillator switch remains as a method of disabling the RTTY display when observing the transmitter. The single tone position with horizontal sweep turned on gives somewhat of a time display for no additional cost.

Figure one shows the circuit as it would appear in the HO-10. Numbered components are original components. Component numbering and values will differ somewhat in the SB-610, but the circuits are similar.

Save the few parts removed and it will be possible to return the unit to its original condition with a few minutes of your time and no expense.

Hoff, Irvin M., "Mainline ST-5 RTTY Demodulator", RTTY JOURNAL, May 1969, p. 4.

Hoff, Irvin M., "Mainline Solid State ST-6 Demodulator", RTTY JOURNAL, September, 1970, p. 5. (part II, October, 1970, p. 3., part III, December, 1970, p.3.)



All numbered components are Heath designations. All resistors are half- watt and capacitors are 600 volt. Tube is a 6J11 dual pentode.

*****

Using the Kenwood T599 on RTTY

BERT KELLEY, K4EEU
2307 S. Clark St.
TAMPA, FL. 33609

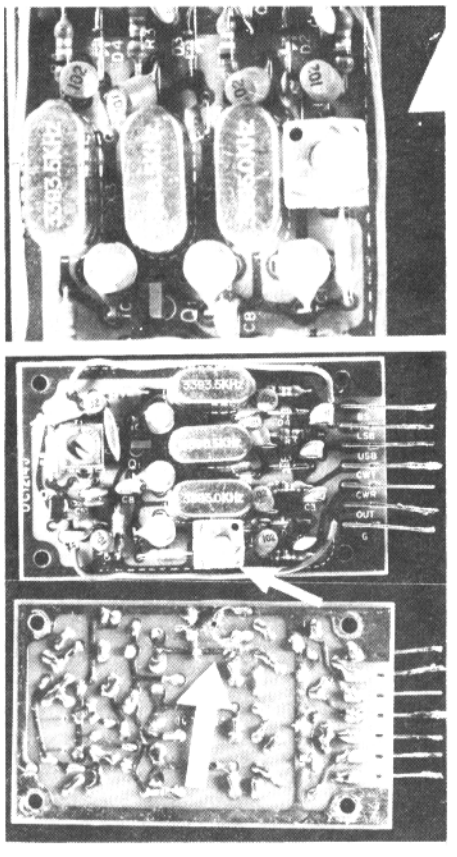
Here are two ways the T-599 solid state transmitter can be keyed for RTTY. It has been pointed out by WB4FPK that the crystal BFO assembly is identical in the transmitter and receiver, that the USB, LSB, and CW crystals are turned on by diode switches, and that the CW crystal has two diode switches marked CWR and CWT, only one of which is used in either the receiver or transmitter.

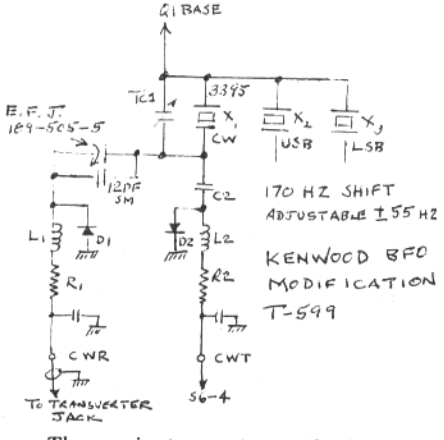
The unused CWR terminals and many of the components wired to it can be used to FSK the transmitter without much effort and when the FSK keying line is disconnected, the CW BFO will operate the same as before the modification.

The BFO board UC1214J is removed from the transmitter and diode DI is removed and saved for re-use. The photos show two views of the board modifications. An E. F. Johnson #189-505-5 air trimmer exactly fits the old diode mounted holes and the diode is reversed in polarity and soldered to the back of the board. Two circuit trails must be opened with a sharp knife -- check the schematic carefully before doing this. A 12 or 18 pf mica is also installed at the back of the circuit board, the BFO is reassembled and mounted in the transmitter.

There is a "Transverter" jack at the back of the transmitter that can be used for the new shielded keying lead. The wire that formerly was connected to this jack is taped up. It will be found that the circuit changes will not affect the CW crystal frequency more than a few cycles. so no adjustment of TC1 is required. Shift is adjusted with the Johnson trimmer, and transmitter power output is adjusted by the "CAR" control under the cover. The transmitter is operated in CW mode.

It should be noted that one of the disadvantages of this system is that the CW crystal is turned on both by the mode switch and the negative mark hold voltage on the fsk keying line that is present with ST-5 and ST-5 TU's, and that this crystal would be on as long as this voltage is present, even when the mode switch is on USB or LSB. The CW crystal would then be on when the operator was working sideband. The remedy is to pull the keying lead from the FSK jack, restoring the diode switch to the normally off condition.





The easiest way to put the T-599 on RTTY is to use the standard low tones

of 1275 mark and 1445 space for 170 shift. No modifications are necessary in either transmitter or receiver, and the sharp 500 hz filter can be switched in and out with the selectivity switch during normal copy with no change in audio tones. Transceive operation is also possible.

The demodulator and AFSK must be equipped for low tone operation. The K4EEU crystal controlled AFSK should have the torroid filter modified to compensate for the lower frequencies. Change the capacitors to .082, .15, and .082, and increase the output coupler to .1 mfd.

WB4FPK "Using Kenwood R-599 for RTTY Sept 1973 Journal

K4EEU "crystal Controlled AFSK" April 1973 Journal.

*****

Solid State Loop Keyer for TT/L- and .TT/L-2

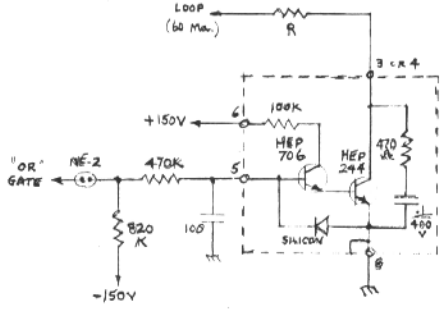
ALBERT KLAPPENBERGER, K3KWX
Rte. 1, Box 227
WESTOVER, MD. 21871

Here is an easily made change that will improve the loop system in the Mainline TT/L or TT/L-2. The circuit was built into the metal box of a plug in relay and was wired to plug directly into the 6W6 socket. The only other changes necessary are:

1-Add a wire to supply 150V to the unused pin (6) on the 6W6 socket.

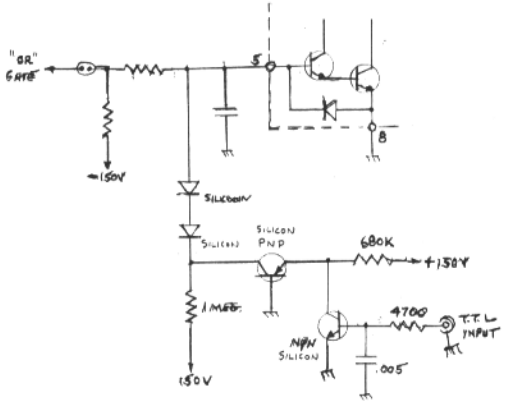
2-Add a resistor (R) in the loop to cut the current back to 60 Ma. This resistor will run around 2000 ohms at 25 W, but should be hand picked for your particular loop.

3-In the TT/L-2 circuit, a diode was added from grid to ground of the 6W6. This diode must be removed.



This further change will allow the loop to be keyed directly from TTL logic levels such as from the output of U8C in the K4FUP/W4VWS TTL Message Generator (QST Nov. '73). The input is high on space, and low on mark, so that no input will cause no interference with normal operation of the TT/L.

The transistors and diodes can be just about anything silicone. High voltage transistors are not necessary.



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RTTY theory & applications.

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

RTTY for Beginners- Part 11

Generating An FSK Signal

Last month we described the basic equipment interconnection necessary for transmitting a RTTY signal. This month we will go into the details of how an FSK signal is generated.

There are two ways to generate an FSK signal:

A) Indirect FSK is obtained by applying an AFSK signal to the audio input of an SSB transmitter.

B) Direct FSK is generated by modifying the oscillator circuit of a transmitter or VFO so that its frequency can be shifted by the signal from a keyboard.

A. Indirect FSK

An AFSK signal consists of one of two audio tones; e.g. a 2125 Hz tone exists when a Mark is sent and a 2295 Hz tone exists when a Space tone is sent. If the Mark tone (2125 Hz) were applied to a DSB AM transmitter, the output from the transmitter would consist of three frequencies, the carrier, the carrier plus 2125 Hz (the upper side frequency), and the carrier minus 2125 Hz (the lower side frequency). If the Space tone (2295 Hz) were applied to the transmitter audio input, the output would consist of the carrier, the carrier plus 2295 Hz (the upper side frequency), and the carrier minus 2295 Hz (the lower side frequency). If the tones were applied alternately (a Teletype signal), the transmitter output would contain the carrier, an upper sideband (carrier plus 2125 Hz and carrier plus 2295 Hz), and a lower sideband (carrier minus 2125 Hz and carrier minus 2295 Hz). If the carrier and the upper sideband were somehow deleted (LSB, SSB), the only signal left would be two frequencies - the carrier minus 2125 Hz and the carrier minus 2295 Hz - this is an FSK signal (including the proper "sense").

B. Direct FSK

The output from a CW transmitter consists of a single frequency. The output frequency can be shifted downward by applying a small capacitance (ca. 3 pF) across the tuned circuit in the oscillator (usually from the oscillator tube cathode to ground). If the small capacitor can be connected and disconnected according to the Spaces and Marks, respectively, in a RTTY signal, then an FSK signal is generated. The most difficult problem with direct FSK generation is the requirement to shift a small capacitance in and out of a radio frequency circuit. Although it would appear that the small capacitor could be simply placed in series with the keyboard contacts and the combination placed from cathode to ground in the oscillator circuit, this arrangement would **not** work because the capacitance associated with the keyboard contacts and the leads from the keyboard to the oscillator would contain far too much capacitance. Also, the RF in the leads to the keyboard would cause problems. In addition, the keying would be "upside down" because the capacitor is to be added when the contacts are open (Space).

Therefore, the capacitor must be switched by "remote control", as it were. The actual circuit used depends upon whether 1) The FSK signal is to be actuated directly from a keyboard or 2) From a voltage developed in a loop associated with a TU. (Last month these were referred to as arrangements #1 and #2, respectively.)

1) Direct FSK from a Keyboard

In Figure 1 is shown the circuit to be added inside the VFO or the transmitter. The basic theory of operation is that when the diode is not conducting (Mark), the entire circuit is assumed to not be present and the oscillator operates at its nominal frequency. When the diode is conducting (Space), the series combination of C1 and C2 is placed across the oscillator circuit and the frequency of oscillation is shifted downward. The radio frequency chokes (RFC1 and RFC2) isolate the diode dc biasing network from the diode and its capacitors (C1 and C2).

When the keyboard contacts are closed (Mark), the top end of the diode is dc grounded and the lower end of the

diode has approximately plus 8 volts on it due to the dividing action of R2 and R3. Therefore, the diode is reverse biased and does not conduct, thus effectively removing the capacitors (C1 and C2) from the circuit.

When the keyboard contacts are open (Space), plus 105 volts dc is applied to the upper end of the diode via R1 and plus 8 volts is applied to the lower end of the diode due to the dividing action of R2 and R3. Thus the diode conducts and effectively connects C1 and C2 to the oscillator, lowering its frequency. The amount of shift is determined by the setting of C2.

There are several notes of caution that should be observed with the direct FSK circuit just described; these cautions also apply to the circuit to be described later. The circuit contains radio frequency energy. Therefore, the actual parts and their placement are important. C1, C2, and the diode should be mounted as close to the oscillator cathode as possible Both RFC1 and RFC2 must have low internal capacitance and low capacitance to surrounding objects. RFC2 shunts C2, and if the capacitance from RFC2 is too high it will result in a shift that is too wide and C2 will become ineffective. The resistors should be mounted away from the diode and C1 and C2. RFC1 and RFC2 are to be physically located between the two portions of the circuit and as far from the chassis and chassis bottom plate as possible. The bypass capacitor, C3, is used to keep the oscillator RF out of the keyboard and any RF from the transmitter output from getting back into the VFO via the keyboard leads. C3 should be mounted at the point where the lead from the keyboard enters the VFO/transmitter chassis/cabinet. For example, if a jack is mounted on the chassis (to permit disconnecting the keyboard from the VFO/transmitter), the 0.001 UF bypass (C3) should be mounted on the jack. Also, there should be nothing within the teleprinter connected across the keyboard contacts; all filters, capacitors, etc., must be removed. The only thing connected across the keyboard contacts is to be C3, and that is to be located as indicated above.

2. Direct FSK From a TU

In terminal units such as the TT/L-2, ST-5, and ST-6, a keying voltage is provided. (Remember that we are now talking about arrangement #2 where the printer and keyboard are in the same loop along with the TU and the loop power supply. Local copy is made directly from that loop. The received is disabled during transmission.) Within the TUs a circuit is provided that samples the loop current; when a Space is present, a positive voltage of about 40 volts appears on the FSK terminal; when a Mark is present, a negative voltage of about 40 volts is present.

Figure 2 shows a typical direct FSK circuit for use with a TU providing a keying voltage. When the TU loop is in Mark, the voltage applied to the keyer is minus 40 volts, the diode is reversed biased, and C2 is disconnected from the oscillator cathode circuit, thus giving the normal carrier frequency. When the TU loop is in Space, the voltage applied to the keyer is plus 40 volts, the diode conducts, thus connecting the capacitor C2 across the oscillator circuit and lowering the frequency.

The comments made previously about care in mounting the components within the VFO/transmitter apply equally well to the circuit in Figure 2. Make sure that C3 is across the lead coming from the TU at the point where the lead enters the VFO/transmitter chassis.

Additional Direct FSK Notes

In both circuits given, the amount of shift is dependent upon the capacitance switched in and out by the diode. Some capacitance is added just simply by adding the components. Therefore, if the VFO was precisely calibrated before the FSK circuit was added, its calibration will now be off. The width of the shift is dependent upon the capacitors added as well as by the strays added. The shift can be varied by varying the variable capacitor, C2. If only one shift is to be used and only on one band, C2 can be set once and forgotten. If variable shift is to be changed.

If the VFO is followed by a multiplier on some bands, the shift will change with the multiplication. This will necessitate readjusting C2.

If many different shifts are desired or required, they can be obtained by placing a potentiometer in the shifting circuit to control the amount of dc in the diode during Space, thus controlling the conductivity of the diode. The the diode does not fully conduct when a Space is sent, the amount of capacitance switched in is not the full amount available and thus the frequency shift is less than the maximum amount. Also, by using a rotary switch, and several pots, each pot can be set for the desired amount of shift for a given band, etc., and just the switch is operated to select the shift desired.

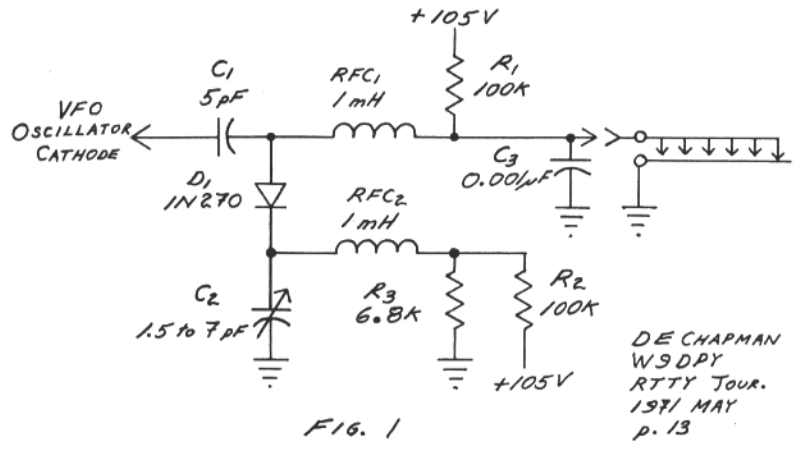

FIG. 1

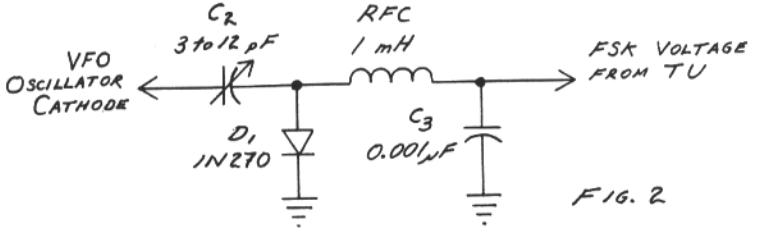

FIG. 2

The circuits given in Figures 1 and 2 turn the diode fully on and off - a method that appears to be much less critical of diode characteristics and temperature than does the partially-conducting shift pot method.

Because the FSK circuit (Figures 1 or 2) is to be added inside a transmitter/VFO, the components might not be the exact values required. The following bibliography lists information appearing in the RTTY Journal for specific transmitters.

Transmitter FSK Information Appearing in the RTTY Journal from 1946 thru 1973

Central Electronics 100V, 200V: 1968 FEB pp. 3-5, 1968 MAR p. 2, 1969 JAN p. 14.
Collins 32V: 1964 SEP pp. 10-11, 1966 JUN pp. 2-8, 1969 MAY pp. 5-6.
KWM-2: 1967 - OCT pp. 3-7.
KWS-1: 1972 FEB p. 13
S line/KWM-2: 1965 JUN p. 8.
32-S1 & KWM-2: 1965 AUG pp. 6-7, 1965 DEC p. 13.
Drake T4X: 1968 MAY p. 3, 1970 OCT p. 2, 1970 DEC p. 9, 1971 APR p. 9.
Hallicrafters HT 32A: 1965 FEB pp. 8-10, 1966 JUN pp. 2-8.
HT 44: 1966 FEB pp. 2-3.
Heath DX-60A: 1968 NOV p. 7 (reprint 1972 NOV pp. 9, 16), 1971 MAY pp. 13-14.
HW-16: 1967 DEC pp. 2-3.
Marauder: 1970 JUN pp. 13-14.
SB series: 1972 OCT pp. 2-3, 1973 DEC p. 17.
SB-101: 1972 OCT pp. 4-5.
SB-200: 1966 APR p. 8.
SB-400: 1964 DEC pp. 12-13, 1965 MAY p. 13, 1966 JUN pp. 2-8.
SB-401: 1970 FEB pp. 7, 14.
Johnson Invader 200: 1972 APR pp. 15-16.
Ranger, Navigator, Valiant: 1968 JAN pp. 4-7.
Military ART-13: 1965 JUN pp. 4-6.
BC-221-Q: 1966 JUN p. 3.
Swan 240 - 350: 1966 APR p. 7, 1968 OCT p. 18, 1969 JAN p. 4, 1971 MAR pp. 2,13.
General information: 1964 NOV p. 7, 1965 FEB pp. 8-10, 1965 OCT pp. 8-11, 1966 JAN pp. 12-13, 1966 JUN pp. 2-8, 1967 FEB pp. 3-4, 1967 SEP p. 12, 1967 DEC pp. 4-7, 14, 16, 1968 FEB pp. 6-7, 20. 1968 APR p. 13, 1971 MAY pp. 13-14.

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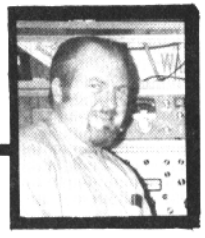
RTTY-DX



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

Hello there. . .

Alan, GI30LV, being a RAF type person can usually be found at various spots around the world at various times and his present duty station is in Germany and he is signing DA2WA. Alan sent us a hilarious story on how he finally got one end of his antenna fastened to the top of a nearby tree 100 feet high. Initial attempts with wrenches whirling on the end of a string and raising the wire with hydrogen filled balloons were not too successful. The final try using a pyrotechnic device called a "rocket" and commonly used on such noisy occasions as the Fourth of July, Gay Fawkes Day, and Bastille Day did the trick and the end of the long wire is firmly imbedded at the very top and accounts for the fine signal usually heard on 14 mhz. Alan wants you to know that QSLs for GI3OLV and DA2WA contacts can reach him via the RSGB or direct to -

Alan Coombes
c/o G.P.O. Kesh
Co. Fermanagh, North Ireland

And in addition, Alan and Joe, DL2AK, have been discussing the possibility of a visit to Andorra, C3-1 this Summer. Joe has the gear and Alan has the Caravan, so more on this later. Also, if there are any prefix of RTTY interest in Western Europe let Alan know and the possibilities will be investigated. Presently there are thoughts of operation from GC, GD, and FC in the months ahead. And that's not all. Alan's good friend Mike Taylor, DA2XT, got interested in RTTY while there in Munster and pretty soon had a station going. However, as is usual in Her Majesty's Service, Mike was suddenly transfered to Central america and he was, can you believe, the chap signing VP1MT from Balize on the week-end of January 26th. Mike really caused a tremendous pileup and continued operation is very possible. You can send your QSL to -

Mike Taylor, VP1MT
633rd Signal Troop
Airport Camp
Belize, Central America

Considering the generally poor conditions of late the above mentioned week-end was one not to be missed. In addition to it featuring the second half of the "Giant Flash Contest", there was activity from such rare places as KX6LA and CP8AU. QSL's for Doug, KX6LA go via K2BT at --

F. E. Gehrke
75 Crestview Rd.
Mountain Lakes, N.J. 07046

for CP8AU send them to --

Cliff rd Greene
P. O. Box 64
Trinidad, Bolivia S.A.

As was mentioned in a previous column the plans for a Caribbean DXpedition by George, W2JNO, and Dave, WA2EXP have now materialized and the boys will be leaving for Grand Cayman, (ZF1) on February 25th for a stay of a week to 10 days. Operating time will be divided between RTTY, SSTV, and SSB. On RTTY the FT-101, plus a linear into a dipole, a Mite, with a ST-6, will be used on all bands. While Charlie, W5QCH, put ZF1CH on the map in 1970 the operation was only of several hours duration and many missed a QSO at that time. Everyone interested will have the opportunity this trip.

Looking ahead to June or July, Hans, DJ8BT, writes to say that he and some of the boys from the GARTG may be active from Ecuador (HC) and Galapagos (HC8). While Ecuador is already in many logs Galapagos will certainly be a "first" on RTTY. We hope to have additional information as the date draws near.

In a recent election of officers held by the SARTG, Bo, SM4CMG, was elected Vice-President and turned over the duties of Contest and Awards Manager to Carl, OZ2CJ. Direct any future inquires about Awards and send future SARTG Contest logs to --

Carl J. Jensen, OZ2CJ
Mejsnersgade 5
DK-8900, Randers, Denmark

Other officers elected were OZ4FF, President, and SM7AP, Secretary. The 4th WW RTTY Contest by the SARTG is planned for the 3rd week-end in August with the rules the same as last year.

The BARTG Contest always heralds the coming of Spring and the rules for this year's Contest will be found on other pages of this issue.

The WAE RTTY Contest sponsored by the GARTG will follow in April and will take place one week earlier than in previous years. Rules for this Contest will follow in the next issue.

The CARTG is thinking of making some changes in the rules for this year's Contest particularly in the area of the "Exchange Points" ruling. As you are aware, in all previous Contests the Exchange Points were based on the Zone Chart system presently used in many of the RTTY Contests. If you would like to make your suggestions known direct them to --

Gwen Burnett, VE3AYL
Secretary, CARTG
85 Fifeshire Rd.
Willowdale, Ontario, Canada M2L 2G9

Do it now as any new rules must be formulated before June.

The most recent W A C Award went to --

Nr. 221 Robert J. Allerdice WA7ASD

Bob is located way up in Seattle, Washington.

Activity is on the increase in the Caribbean with Andre, FM7WD just starting up with excellent narrow shift signals and Frank, 9Y4VU is back in the swing of things with a new ST-5 TU and has been very active in the contests. HP1AH has been printed sending test tapes at 50 baud with really strong signals. Commercial station, CLN487, Habana, Cuba must have tuned up on the wrong harmonic lately as he has been heard on 14090 khz sending RY's on 50 baud, 850 shift, upside down, and real loud.

NOW HEAR THIS -- Next month we will publish the RTTY-DX listing so please have your WKD/CFMD totals to me by March 1st. There have been a lot of changes taking place lately and there is now lots of room at the top of the list. At that time we will also make some sweeping deletions on stations that have not up-dated their totals in a reasonable time. It is a very simple game to play. All I need is two numbers -- DX countries worked/DX countries confirmed. No QSL's, no list, just two numbers.

DX - RTTY March 1964

Another new country on RTTY. SM6CSC is QRV using a Model 15. Arnold, KW6DS is coming thru with fb signals on week-ends. K3GIF (now W3UN) reports two SV stations soon to be QRV, one from Greece and one from Crete. Alan, G2HIO sends out BARTG news bulletins at regular intervals. QSO between XE1YJ and DL4IA another "first" on RTTY. KP4GN QRV on 20 and 40 meters. FG6XT has a motor tuned dipole at 110 feet for 40 and 80 and is 20 over nine in the States.

Many thanks to W2LFL, W3DJZ, and DA2WA among others.

73 de John

***

BARTG CONTEST

CONTINUED FROM PAGE 3

per Country worked including their own. **NOTE** Any one Country may be counted again if worked on another Band but Continents are counted once only.

SCORING.

(A) Two way exchange points times total Countries worked.
(B) Total Country points times number of Continents worked.
(C) Add (A) and (B) together to obtain your final score.

Sample Score.
Exchange points (302) x Countries (10) equals 3020
Country points (2000) x Continents (3) equals 6000

(A) and (B) added to give a score of 9020

LOGS AND SCORE SHEETS.

Use one Log for each Band and indicate any rest periods. Logs to contain:
Date, Time GMT, Message and RST numbers sent and received and exchange points claimed. **All Logs must be received by May 31st 1974 to qualify.**
Certificates will be awarded to: The leading RTTY Stations and Short Wave Listeners. The final positions in the Results Table will be valid for entry in the "World Champion of RTTY" Championship.
The Judges decision will be final and no correspondence can be entered into in respect of incorrect or late entries.
Send your Contest Logs to:

Ted Double G8CDW,
89 Linden Gardens,
ENFIELD,
Middlesex,
England. EN1 4DX.

ADDITIONAL NOTES.

(A) If a Contestant manages to contact 25 or more different Countries on two way RTTY during this Contest a claim may be made for the QUARTER CENTURY AWARD issued by the British Amateur Radio Teleprinter Group and for which a charge of 2 Dollars U.S. or 8 IRC's is made. Make your claim at the same time as you send in a Contest Log. Holders of existing QCA Awards will automatically have any new additional new Countries added to their records.
(B) If any Contestant manages to contact Stations on two way RTTY with all six Continents and the B.A.R.T.G. Contest Manager receives Contest Logs from the operators in those six Continents a claim may be made for the WAC Award issued by the RTTY JOURNAL. The necessary information will be sent on to the RTTY JOURNAL who will issue the WAC Award free of charge.

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HITS & MISSES

From The Editor and his Mail

Ron Guentzler, W8BBB, has been selected as moderator of the RTTY forum at the Dayton Hamfest in April. Ron would appreciate hearing from anyone that will volunteer to talk on any RTTY subject. Ron would also like to hear of any suggestions as to topics that would be of interest to those attending. Write Ron at Rt. 1 Box 30, Ada, OH. 45810.

***

GOOD THINGS COMING. We expect to have a number of articles by Irv Hoff, W6FFC in the near future issues. Irv is a prolific writer on RTTY equipment ST-series of demodulators - AK-1 AFSK generator and many others so we know you will enjoy them.

***

Dayton - April 26-28. Bigger and better than ever AND the Dayton bunch have promised some gasoline for those driving home on Sunday. After our experience with gas in Florida it might pay to drive there just to get a tank full. Hospitality suite at the Imperial North Motel. See the classified section for data on receiving all information.

***

The following was stolen from the Australian E.E.U. magazine and we in turn stole it from the CARTG NEWS. If this applies to these countries maybe our problems are not as local as we think --

The Little Red Hen and the Free Enterprise System.

Once upon a time there was a little Red Hen who scratched behind the barn and uncovered some old radio parts. She called the other animals in the barnyard and said:
"If we all scratch together, we can find enough parts to make some ham gear, and talk to other animals all over the world."
"Not I", said the Cow.
"Not I", said the Duck.
"Union doesn't allow me to scratch," said the Pig.
"Then I will dig them up," said the little Red Hen. And she did.
When she had dug up enough parts, the Little Red Hen said, "Who will help me put together this gear?"
"Not I," said the Cow. "I was a dropout and don't know how."
"Not I," said the Duck. "I might lose my welfare benefits if I did such work."
"Not I," said the Pig. "If I'm the only one helping, it would be discrimination."
"Then I will," said the Little Red Hen, and built a fine ham station.
"I want to talk," said the Cow. "Let's yack with some girls," said the Duck.
"I demand equal air time," said the Pig.
"No," said the Little Red Hen. "I did it all myself, and I'm going to relax and work DX".
"Capitalist," said the Cow. "Equal time, equal time," squawked the Duck. "Pig!" squealed the Pig.
They painted big signs and picketed the Little Red Hen's radio shack, and marched aroung singing "We shall overcome." And they did.
For when the farmer came to investigate the racket, he said: "You must not be greedy, Little Red Hen. Look at the oppressed Cow. Look at the underprivileged Pig. Look at the less fortunate Duck. You are making second-class citizens of them."
"But I built it all myself," said the Little Red Hen.
"Fine," said the Farmer. "That is the wonderful free enterprise system. Anyone can provide himself with anything he wants. In many barnyards the Farmer would take it all away from you. Here you only must share the fruits of your labor with your less privileged neighbors."
So the Little Red Hen sorrowfully dismantled her radio station, and painted a protest sign, and learned to sing "We Shall Overcome." And she lived happily ever after with her barnyard friends and grew fat on the handouts of corn from the kind Farmer. But sometimes her neighbors wondered why she built no more ham stations.
READ THIS TWICE- IT's WORTH IT.

Automatic CR and LF Modification for 15/19 Printers

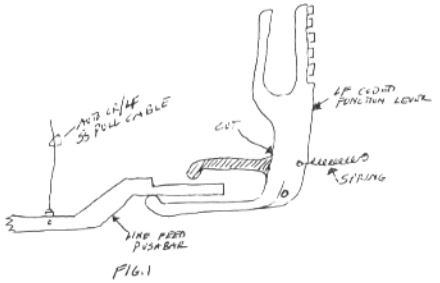
THEODORE STAHL, W8MO
FRED GHOFULPO, W8PYM
2134 Hawthorne Rd.
GROSSE POINT WOODS, MI. 48236

In past issues of the RTTY Journal, there are several articles devoted to this problem. Two are on the problem of proper operation of the Auto Linefeed.

Here is another solution that came about when I borrowed a Model 19 Printer from Fred and then attempted to put a Simplex ACR/LF Kit on the machine.

ACR functioned as soon as adjustments for operation were completed.

However I spent many hours on the Line Feed problem. I finally persuaded Fred to stop in and after examining operational results he decided operation was being blocked by the LF Coded Function Lever.



The spring was unhooked from the LF Coded Function Bar. I was removed and the shaded area cut off as indicated in Fig. 1. After making this cut the Coded Function Lever was reinstalled. The cable pickup Hook had to be readjusted for proper timing and we were in business. No overlines or black boxes at the end of the line. Maybe others have had this problem and did not realize it. All three of the articles were studied and suggestions tried before the answer was found.

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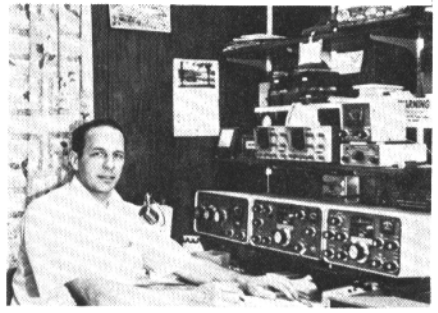

"WALT" WA8PVS

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BACK ISSUES

New subscriptions and classified ads are cash in advance as we have no method for 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. Back issues - if available - may be ordered at 30¢ each at time of subscription. The JOURNAL is mailed about the 20th of the month preceding the dated month. May and June are a combined issue and July-August is a combined issue.

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1969--OCt.-Nov.-Dec.- [3]
1971--May.-June.-July.-Sept.-Nov.-Dec.- [6]
1972--Feb.-Apr.-May.-July.-Sept.-Oct.-Nov.-Dec.-[8]
1973--Complete- [10]
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Editor & Publisher - 'Dusty' Dunn, W8CQ

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MORE RTTY! ONLY HAM RADIO MAGAZINE consistently brings you more RTTY articles and better RTTY articles than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. $7.00 per year, $14.00 for 3 years. Ham Radio, Greenville, NH 03048.

TELETYPE, KLEINSCHMIDT, MITE, gears, ribbons, supplies, parts, manuals, tuning forks, motors; tape $9.00 per case. Mite 66 wpm printer set, ditto. SASE for list Typetronics, Box 8873, Ft Lauderdale, Fl. 33310. W4NYF. Wanted- Northern Radio 107 teleprinter parts.

BACK ISSUES OF RTTY JOURNAL - I have a complete file of all issues from Vol. 1 No. 1 to date. Will reproduce any issue for $1.10 pp. Add 25¢ for air mail delivery. John Isaacs, 3175 Val Verde Ave., Long Beace, CA. 90808.

NEWS-NEWS-NEWS - Amateur Radio's Newspaper, "Worldradio", Trial subscription - Two issues for one dollar. "Worldradio". 2509-F Donner Way, Sacramento, Calif. 95818.

OA-5 SOLID-STATE TERMINAL UNITS for sale. All of the function of ST-6 but on one circuit board. Board with parts list and layout, $15.00. Kit of parts, less cabinet, but including circuit board, $100.00. Circuit board aligned and tested, ready for your cabinet, $160.00. Complete unit, ready to put on air, $210.00. Ken Simpson, WA8ETX, 3700 Mountview, Alliance, Ohio 44601.

HAL COMMUNICATIONS CORP.: HEADQUARTERS for MAINLINE Solid State RTTY Equipment. In demodulators, choose from the incomparable ST-6 or, for a low cost beginning in RTTY, the ST-5. Tailor either to your requirements by selecting the 425 Hz press discriminator, the AK-1 AFSK oscillaror, and tabe or rack mount cabinets for the ST-6, or the AK-1 AFSK and the ST-5/AS autostart for the ST-5. Full details available in our current catalog. Charge your purchase to your BankAmericard or Mastercharge account. Everything is going up, but our prices haven't changed in 2 years, so act now. HAL Communications Corp., Box 365RJ, Urbana, Il. 61801. Phone 217-359-7373.

FOR SALE: MITE EQUIPMENT. TECHNICAL MANUALS. TM-03315-15, $9.95. Navships 95898, $13.75, Navships 0967-170-8010, $12.50. Navships 0967-066-1020, Simplified Preventive Maintenance Procedures for TT-298s and TT-299s, $4.50. Shipped postpaid, No CODs. Allow 3 to 4 weeks for delivery. Harry F. March, 200 Fox Drive, Winchester, VA. 22601.

ST-5A Boards only $5.25. Parts kit $54.00 (includes boards) Mod. kit for up-dating ST-5 to an ST-5A, $9.00. ST-6 boards only $18.00 (8 original by Irv Hoff W6FFC). Pemco 50A frequency counter semi-kit $125.00, Pemco SC250 frequency pre-scaler kit, $30.00. ST-5A, AK-1, ST-6 boards are 12 pin plug-in. All boards etc. shipped postage paid. All boards G-10FR4 glass epoxy and plated, all boards are drilled. Please write for details. Pemco, 422 18th St N.E. Salem. Oregon, 97301.

COLLECTOR wants back issues of RTTY Journal before 1969. W6ISQ, 82 Belbrook Way, Atherton, Cal. 94025

QSL'S MADE FROM YOUR LAYOUT (camera ready) One color, $22.50 per 1000 - Sample catalog 20¢. N & S Print. PO Box 11184, Phoenix, Ariz 85061

SELL; MODEL 28ASR, Mark111, LCD T.D. $600.00 28RO, $150.00. Wanted-self contained LXD T.D. Ed Wagner, 1018 Birch Haven Cr., Monona, WI. 53716.

WANTED - 33ASR, B. A. THUNMAN, W8ISG, 71 McCollum Street, Galesburg, Michigan 49053. Phone 616 665-7071 or 731-5164.

DAYTON HAMVENTION Expands to three days April 26, 27, 28, 1974 at HARA ARENA and Exhibition Center. Brochures mailed March 15th. Write for information if you have not attended the last two years. P. O. Box 44, Dayton, Ohio 45401.

CHICAGO AREA RTTY OPERATORS; Expert repair work performed at reasonable prices. Cleaning and lubrication; printers $10.00, keyboards $5.00, reperfs $7.00. Repair work $15.00 plus parts, any Teletype apparatus. Rebuilding by estimate. Phone 312-392-2358, ask for Neil.

MANUALS: - TT-117/179-$10.; TT98, TT99, TT-100, $7.50; TT-107, TT109, TT-63A/FGC, TG-7A, CV-591A/URR, $6.50; Model 14 Tds $2.50; TS-2/TG, TT-122A, TDA-2, $4.50; Other manuals R-390A/URR, USM-32, SRR-13, FR-114/U, $10.00; R388/URR, USM-16, USM-25A/B, USM-50, $7.50; R389/URR, R-390/URR, R-220/URR, $6.50. Thousands of other manuals in stock covering military surplus receivers, transmitters, test sets, scopes, etc. Send 50¢ coin for large list #73. W3IHD, 7218 Roanne Drive, Washington, DC. 20021.

BAUDOT LOOP TO ASCII CONVERTER connects right into your loop and delivers 8-level or 6-level ASCII for electronic readouts or ASCII-coded c.r.t. display systems. Loop interface features bridge rectifier and opto-isolator: connects anywhere in your loop trouble-free. Internal latch recognizes LTRS and FIGS codes for correct translation of all RTTY symbols; unshift on space available with one jumper wire on p.c. board. Wired and tested, complete except for 5 volt power supply and one potentiometer, on one 4X6 inch circuit board: $120. Petit Logic Systems, P. O. Box 51, Oak Harbor, Wa. 98277.

RTTY FREQUENCY STANDARDS --- Three brand new Tuning Forks, better than 0,0005 accuracy, especially designed for complete adjustment of TU filters and/or AFSK oscillators at 2125, 2295 and 2975 --- available separately at $7.40 each or set of three $19.90 postpaid. Henry Frankel, Box 535, Bellmore, NY 11711.

CIRCUIT BOARD SET for "Low Cost Rtty Counter" Oct 73 Journal. Includes two counter modules, FET front end, 60 hz time base, and a bonus scaler board. Scaler will operate to at least 220 mhz. Boards are G-10 epoxy, plated, undrilled, with full size photos showing each assembly. Necessary info included. Set $10 postpaid in US., add $8 for Universal Frequency Standard Board. Bert Kelley, 2307 S. Clark Ave., Tampa, Florida 33609.

HAL COMMUNICATIONS CORP. is the place to order the ST-6, ST-5, ST-5A, AK-1 and the ST-6 425 Hz discriminator if you want to receive a complete kit containing all parts and a complete manual. New 46 page ST-6 manual now available for $4.00 ppd. BankAmericard and Master Charge accepted on equipment orders. HAL Communications Corp., Box 365RJ, Urbana, Ill. 61801. Phone 217-359-7373.

WANTED; GEAR SET FOR LORENZ Machine for 60 wpm. Also diagrams and manual. Bruce Balla, VE2QO, Box 392, Montreal Int'l Airport, Quebec, Canada, H4Y-1B1.

WANTED: CENTRAL ELECTRONICS 600 LINEAR - Mint condition - Len Humphries, 41 Kildonan Dr. Scarborough, Ontario, Canada, M1N-3B7.

CLASSIFIED ADS-

U.S. GOVERNMENT SURPLUS Typewriters, Jeeps, Walkie Talkies, Rifles, Binoculars, Hand Guns, Boats. Official Guide tells you how and where to buy. $2.00 H. Morgan, 883 Diana, Akron, Ohio 44307.

RTTY VIDEO DISPLAY UNIT; 1000 characters, plugs into loop or logic circuits. ASCII or Baudot available. Works with any TV set. Leland Associates, 18704 Glastonbury Rd. Detroit, MI. 48219

M32RO, M33RO TELETYPES: Prices from $150 to $275 FOB. Also fast parts service on all 32/33 K1YCM Les Veenstra, ACTON TECHNICAL SERVICES, 919 Crystal Springs Ave., Pensacola, FL 32505. 904-434-1297

ST-5 AND POWER SUPPLY BOARDS, all parts, no transformers. No time to complete. Make offer. 100 KHz crystals octal base $2.50 ppd. Nat Stinnette Electronics, Tavares, FL 32778.

WANTED 51S1 IN EXCELLENT CONDITION, serial above #500 with manual and boxed. State price delivered to airline Indicate serial Nr. and condition. Arthur S. Cohen, Risco 437, Mexico 20., D.F. Mexico.

FAX PAPER: For Desk-Fax, new (not surplus), precut (not rolls), $15 per thousand sheets, postpaid worldwide. Bill Johnston, 1808 Pomona Drive, Las Cruces, New Mexico 88001.

M15 & M19 WIRING DETAILS BOOKLET provides maximum flexibility of use. Schematic shows all terminal points; M15 schematic shows all wiring; detailed instructions for wiring M19 tables. $1.95 per set, postpaid. TECHNICAL MANUAL on M14 Tape Distributor (description, adjustment, parts). New. $8 postpaid. 11/16" perforator tape, 10 rolls/$4, 40 rolls/$12.95. Fax paper, RTTY supplies. Send for list. Jim Cooper, W2BVE, POB 73, Paramus, NJ 07052.

UNIVERSAL AFSK, AUDIO, AND VLF SYNTHESIZER delivers phase-continuous output from 1 to 99,999 Hz with accuracy, calibration, and resolution of one Hertz. Use it to operate AFSK between any two frequencies you program, as a precision audio generator, or as a frequency source in an autostart frequency synthesizer. Kit of all parts, $135. Write for information. Petit Logic Systems, Box 51, Oak Harbor, Wa. 98277.

WANTED: LTPE-1 Perforators; LRB-6 Underdome reperforators - must have 3-speed gear box. Also interested in Models 28, 32, 33, 35 & 37s. Will pay top price. Amber Industrial Corp., Phone 201/824-1244.

METRIC SYSTEM EXPLAINED, 500 Physical Measurements Converted. Booklet $2.00 H. Morgan, 883 Diana, Akron, Ohio 44307.

HAL COMMUNICATIONS CORP. announces the DKB 2010 Dual Mode Keyboard. Provides flawless transmission of RTTY and Morse Code with standard 3 character buffer and optional 64 character buffer. Call letter identifier and "Quick Brown Fox" sequence standard. Write for detailed spec sheet. See it on display at Dayton. HAL Communications Corp., Box 365RJ, Urbana, IL 61801. Phone 217-359-7373.

FOR SALE; MODEL 15, Excellent condition, can ship, $75.00. B. A. Thunman, W8ISG, Galesburg, MI. 49053.

TELETYPE CORP. MODEL 28KSR in floor mount console cabinet, complete with keyboard and typing unit, $250. Teletype Model 28 ASR complete with typing perforator and transmitter distributor in floor mount cabinet, $675. Both excellent condition. FOB Oakland. M. Booth, 2042 E. 14th St., Oakland, CA. 514-534-1300.

PHOTOSTAMPS OF YOUR STATION with gummed backs for your QSLS. Mini stamps $2.50 - 100 Midi stamps $2.00 50 Maxi stamps $2.00 Samples 25¢ Morgan 883 Diana Akron, Ohio 44307

WANTED: MODEL 33 & 35 EQUIPMENT. Complete or partial units, any quantity. Will pay shipping. Terminal Systems, Inc., 11300 Hartland St., North Hollywood, CA 91605 (213) 769-6772.

"RTTY SPEED CONVERTER" A drilled, fiberglass 4" x 6 1/2" printed circuit board now available for the WA6JYJ speed converter in the DEC 71 issue of HAM RADIO. $6.50 postpaid. Complete parts kit including PCB, $42.00, postpaid. Martex Corp., 519 South Austin, Seattle, WA 98108.

PROGRAMMABLE RTTY DIGITAL STUNT BOX responds with switch closures and a return message when someone calls your station. 64-letter buffer memory (FIFO) plus choice of two types of keyboard input (32 homemade switch closures to ground or 100 w.p.m. loop) lets you type fast and error-free, yielding 60 w.p.m. output. End of line indicator for keyboard input helps prevent overprinting. Larger memory and other options available. Complete kit $245. Write for information. Petit Logic Systems, Box 51, Oak Harbor, Wa. 98277.

#28 Reperforator-transmitter with 3 speed gear shifts ready to operate $145. #28 Typing reperforator 60 or 100 WPM $49. #32KSR - $250. R-390A $475.00. Alltronics - Howard Co. Box 19, Boston, Mass. 02101 (617-742-0048).

WANTED -- RTTY JOURNAL ALL 1969-1970 plus January-April 1971. **SELL** - TS1618 audio frequency shift converter tester with internal audio counter and book $250 or part trade toward 28 ASR; RBK14 $75; AN/WRR3A v1f digital $300; GPR90 $150; SX28A $75; AN/SRR13A $125; AN/SRT-15 with all books, has 4-400A final, frequency synthesizer, hand keyer, machine keyer, FAX keyer and frequency shift keyer $500. All pickup San Diego or Los Angeles. W6CRG 11007 Explorer Road, La Mesa, Calif. 92041.

FOR SALE: TT/L-2 WITH 170 AND 850 BUTTERWORTH CHANNEL and discriminator filters, glass board, new parts, 19' rack panel 8-3/4" high - $100. HAL Touchcoder II morse codetyper built into new Microswitch keyboard enclosure - $125. HEATH HO-10 monitor scope - $50. All units in excellent operating and physical condition with manuals. Shipped prepaid within continental USA. Robert Boyd, Woodlawn Avenue, RFD 2, Kennebunkport, Maine 04046.

FOR SALE: ST-6-170 - $150; ST-5-170/850 - $75; Heath HW-7 QRP with Ni-Cad pack and charger - $70 or offers; all equipment new and 100% operational. Need: Series-governed (Universal) motor for Kleinschmidt TT-4, TT-98 etc. S.A.S.E. brings list of more RTTY and miscellaneous gear. All prices plus shipping. L. L. Filby K1LPS, USNAF - Box 80 - New York, N.Y. 09520.

HAL COMMUNICATIONS CORP. can provide you with the proven video display system, the RVD-1002 When coupled with the RKB-1 keyboard, you will have the ultimate in noiseless, reliable reception and transmission of Baudot coded TTY. The RVD-1002 receives TTY pulses from the HAL ST-6 or any other demodulator, and generates a 1000 character display. Copies at all four standard speeds with selectable unshift on space. The RKB-1 features a high quality commercial keyboard, reliable solid state circuitry, and a rugged, attractive cabinet. Our prices haven't changed for 2 years, so act now. BankAmericard and Mastercharge now accepted. HAL Communications Corp., Box 365RJ, Urbana, Ill. 61801. Phone 217-359-7373.

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