JANUARY 1981

RTTY Journal

VOLUME 29 NO. 1

75 CENTS

EXCLUSIVELY AMATEUR RADIOTELETYPE

TOM GIBSON,W3EAG WITH HEATH H-8,MODEL 5A TELETYPE AND HIS ARTWORK

CONTENTS

RTTY JOURNAL

Dee Crumpton,KA6NYW
Editor & Publisher
P.O. Box RY
Cardiff-by-the-Sea,
California 92007 U.S.A.

John P. Goheen,KA6NYK
Associate Editor

THE RTTY JOURNAL IS PUBLISHED 10 TIMES PER YEAR. MAY-JUNE & JULY-AUGUST ARE COMBINED.

Second Class permit
Encinitas, CA 92024

Business Offices
1155 Arden Drive
Encinitas, CA 92024

POSTMASTER SEND FORM 3579 to:
POB 179 Cardiff,CA 92007

BACK ISSUES

A duplicate of any back issue may be obtained from R. Wilson, 4011 Clearview Drive, Cedar Falls,IA 50613. $1.00 PPD.
Reprints of all UART articles $2.00

SUBSCRIPTION RATES

USA	$ 5.00 per year
Canada surf.	$ 6.50 per year
Canada Air	$ 7.50 per year
Mexico surf.	$ 6.50 per year
Mexico Air	$ 7.50 per year
Foreign surf	$ 8.50 per year
Foreign Air	$12.00 per year

ALL ABOVE MUST BE IN U.S.A. FUNDS

SUBSCRIPTIONS AND ADVERTISING ARE CASH IN ADVANCE,

FOREIGN SUBSCRIPTION MANAGERS

THE FOLLOWING MANAGERS ARE DROP SHIPPED THE RTTY JOURNAL ON THE SAME DAY THE RTTY JOURNAL IS MAILED BY SURFACE AND AIR MAIL TO THE REST OF THE WORLD. IN SOME CASES AIL MAIL GETS TO OUR READERS FASTER THROUGH OUR MANAGERS, IN OTHER CASES IT DOES NOT. HOWEVER, IT IS NOT AS COSTLY TO GO THROUGH MANAGERS.

EUROPE

JEAN HURTAUD, F8XT
CHILLAC
16480 BROSSAC, FRANCE

AUSTRALIA

NORMAN WILSON, VK4NP
POB 81 ALBION, BRISBANE
QUEENSLAND, 4010 AUSTRALIA

ENGLAND

DR. ARTHUR GEE, G2UK
21 ROMANY ROAD, OULTON BROAD
LOWESTOFT, SUFFOLK
NR32 3PJ, ENGLAND

JAPAN

KANJI YAMAMURA, JH2FHX
2-42 UMENOKI, IZUMI-MACHI
TOKI CITY, GIFU-PREF
JAPAN MAIL NO.509-51

RTTY MICROCOMPUTING
BY: CLAYTON W. ABRAMS
1758 COMSTOCK LANE
SAN JOSE, CALIFORNIA 95124

In my last column I discussed the various types of microcomputer systems. This time I'll discuss interfacing the microcomputer to your RTTY hardware. The interfacing can be very easy or difficult depending on the system to which you wish to attach. The Ham Radio hardware can be contained on a special card which can be plugged into the bus, or in many cases, the interface is part of the basic system which you have. The interface is usually a port of some type. This port can be serial or parallel. The parallel ports are the most flexible and can be interfaced quite easily. Most serial ports are designed for ASCII use and have too many data bits for Baudot code reception and transmission. So I will not talk much about these devices. Let us explore how parallel ports can be best utilized.

You may ask "What is a port?" Well a port is nothing more than a path from the microcomputer to the outside world. Typically a port has 8 data bits or more on a single integrated circuit. Each bit can be visualized as a single wire which can be turned on or off under program control. Sound easy? Well it is! If you want to turn on one of these port bits, all that has to be done is to program the bit as a one or a zero. Likewise if you want to read the status of the bit to see if a signal is present, all that has to be done by the computer is to read the port. You can now test if the bit is on or off by a special instruction. By the way, a "one" in computer jargon is a positive voltage (approximately 5 volts) and a "zero" is ground. Well this all sounds quite simple so let's confuse the issue by bringing up another factor called time. Time is another dimension which you can handle by two methods.

You can attach some external hardware to the port to control the timing or you can let software handle the timing. This is entirely up to the person designing the system. If your specialty is not programming then hardware can do the trick. If you enjoy programming, you may wish to use this method. As you know in order to transmit RTTY at 60 WPM a data rate of 22 msec and a stop bit time of 31 msec duration must be used. These timings can be generated in one of two ways:

1. HARDWARE METHOD

The hardware technique is to attach a universal asynchronous receiver/transmitter (UART) to a micro parallel port. This device is typically an integrated circuit with 40 pins. An excellent device for this application is a 1602 UART which is available from a number of sources for around $5.00. This device can receive or transmit data with 5 to 8 bits, at whatever data rate applied to the chip. This data rate is controlled by an oscillator on the interface circuitry. To change speeds the frequency of this oscillator must be changed. The output of this device is a positive or zero level TTL level. Therefore, to use this for RTTY, a modulator and demodulator (T.U.) must be connected to the UART.

2. SOFTWARE METHOD

The software methods are a little more abstract, however, they accomplish the same effect. However, they have two big advantages:

A. The software technique uses less hardware and the only cost is the expense of software development.
B. Any data pattern (ASCII or BAUDOT) and speed can be generated with slight program changes.

The software timing technique is simple to explain. All youhave to do is turn on a bit port. Place a delay in the program by counting down a counter until it is zero. You can then turn the bit on the port off. The duration of the delay will be the period of the signal. To change the frequency of the signal all you have to do is change the initial value loaded in the counter.

So far I have only discussed the transmission of RTTY, reception is the exact opposite. All you have to do is reverse the process. To do this you first look to see if a signal is present. If it is you delay a data bit and one half. Then look for an on conditionm if so you have received a data bit. You can then repeat the entire process until an entire five bits or a Baudot character has been received.

Well, with this background, you are now armed with enough information to understand an example of interfacing in my next column.

In all of my RTTY microcomputer applications I have used the software technique for transmission and reception. I have written about 10 different software packages for the 6800 and 6809 microcomputers. Just last week (11-30-80) I received my new TRS color computer which uses a 6809 microprocessor. I believe this is an excellent low cost ($399) computer for Amateur Radio applications. Interfacing is very simple due to the built in RS232 port. I was very pleased to find the color computer, unlike other Radio Shack products, very clean with no TVI or RF interference. Even with the computer a few inches away from my TV set. It will be a lot of fun developing RTTY and SSTV software packages for this machine. Imagine looking at RTTY in full color on your TV.

See you in a month or so.....Clay

****
****

SO SORRY WE ARE LATE BUT when your right hand man around the JOURNAL has a heart attack and then open heart surgery (a quad bypass) the JOURNAL tends to get neglected in the shuffle of visiting the hospital, keeping friends and family informed and the JOURNAL vital mail answered. John came through surgery fine (day after Thanksgiving) fine and is now responding quite well.

Many thanks to all Amateurs concerned about John.

NOTES ON 74S188 FROM "DOWN UNDER"

BY RON COLLINS
VK5RY, 5 WINSTON COURT, MODBURY, SA5092
AUSTRALIA

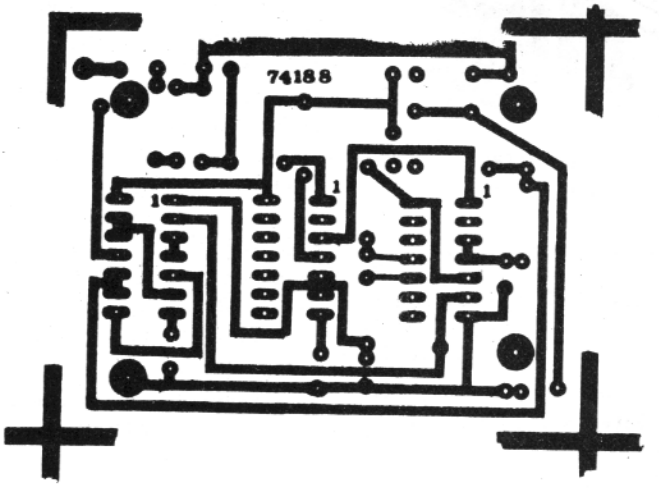
The September 1980 issue of the JOURNAL has prompted me to send the enclosed information about a 74S188 programmer.

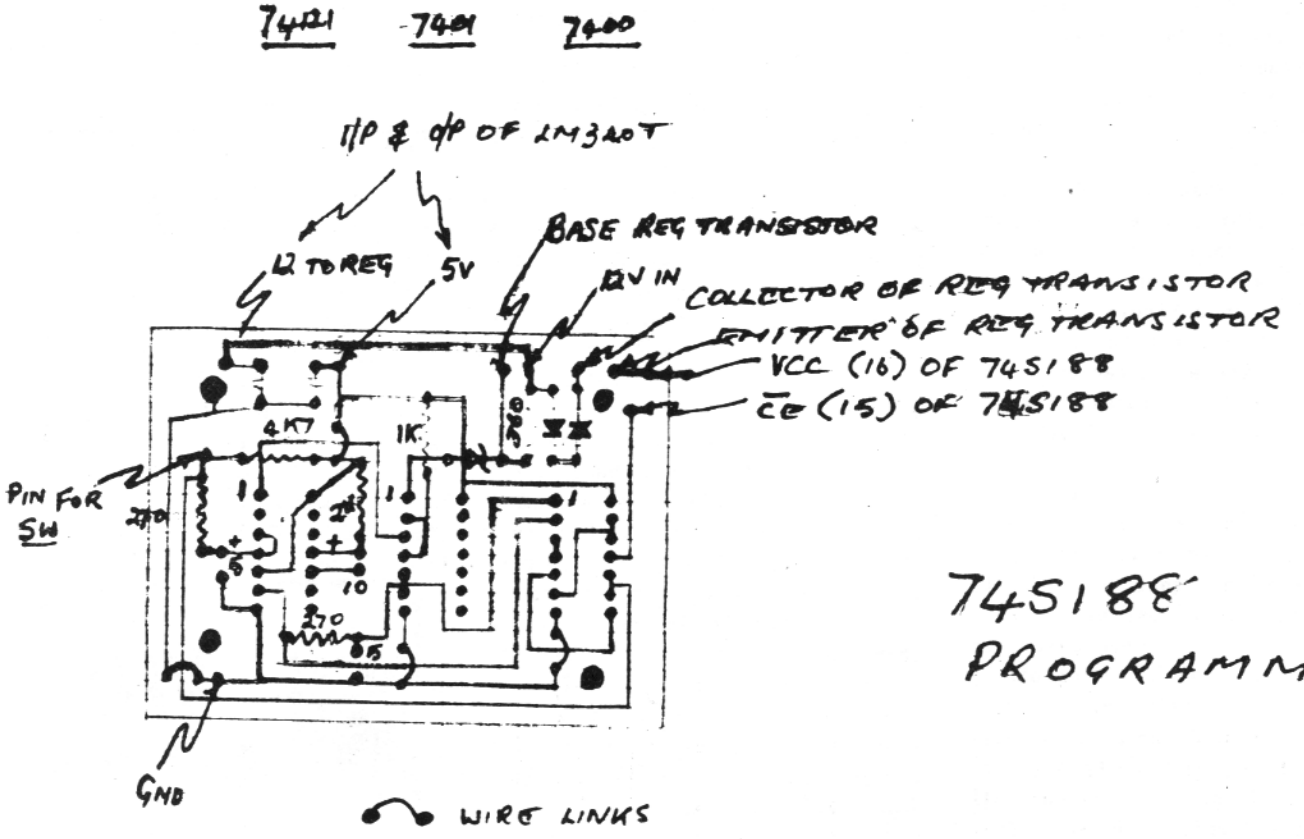
Having tried all the makeshift programmers that invariably failed to work properly, I decided to apply "Murphy's Law" and do what the manufacturers of the chip specify; that is, apply the correct voltages at the right time.

The idea came from a Japanese CQ magazine of some years ago, and is modified to suit my own requirements, but it is guaranteed to work, and has the added advantage that all 8 bits in the address can be "burnt" at one hit, instead of individually as others are "supposed" to do.

Have included a photo of the box (Editors note- photo was much to dark and "red" to print), and a copy of my art work, but the whole thing is so simple.

74188 Programmer --VK5RY





74S188 PROGRAMMER

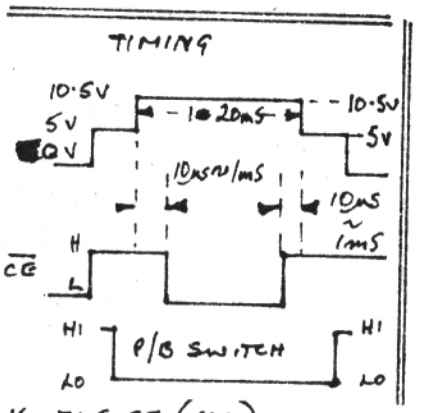
TO PROGRAM:

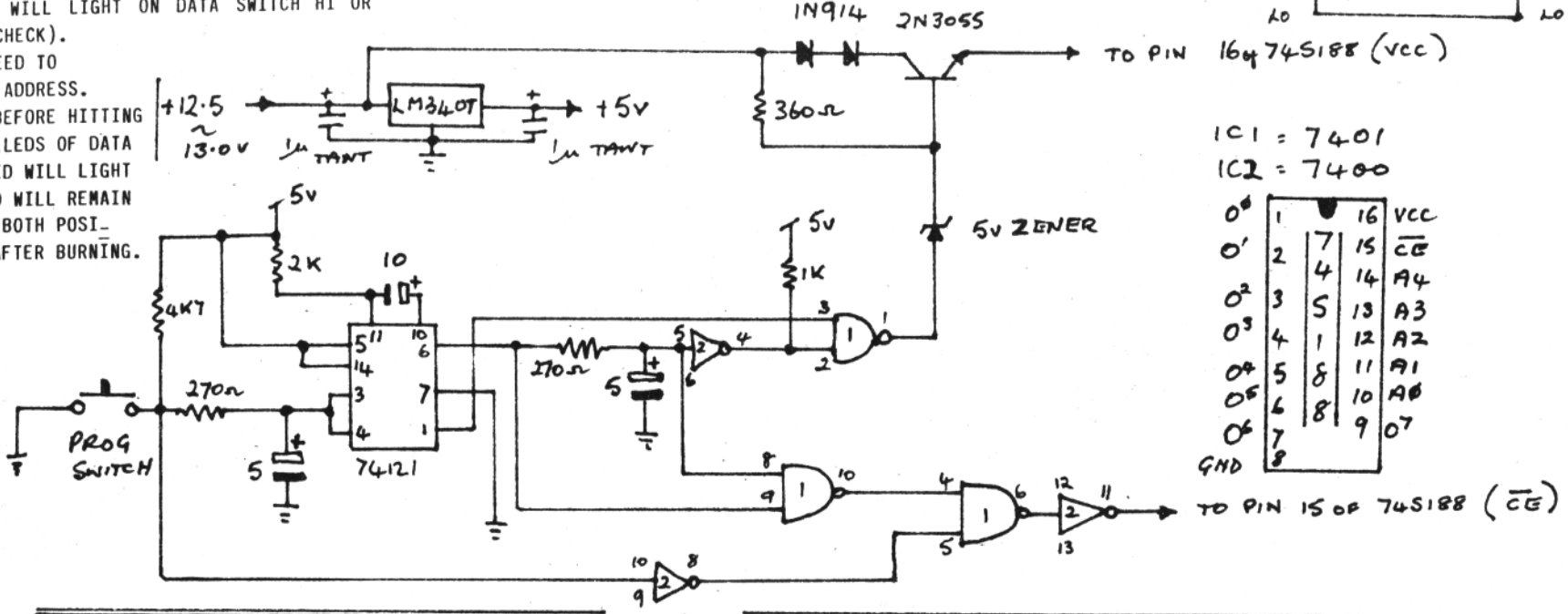
1. INSERT 74S188 IN SOCKET BEFORE APPLYING 12.5 - 13.0 V.SUPPLY.
2. APPLY POWER, ALL DATA SWITCHES IN HI (NON-PROGRAM POSN).
3. RUN THROUGH ALL ADDRESS SWITCH POSITIONS AND LEDS WILL LIGHT IF CHIP OK.
4. SET UP ADRESS NO Ø (ØØØØØ) Ø=LO, 1=HI.
5. CODE DATA SWITCHES LOW AS REQUIRED.
6. HIT BUTTON ONCE.
7. LEDS WILL LIGHT ON DATA SWITCH HI OR LO (CHECK).
8. PROCEED TO NEXT ADDRESS.

NOTE: BEFORE HITTING THE SW, LEDS OF DATA SELECTED WILL LIGHT UP, AND WILL REMAIN LIT IN BOTH POSITIONS AFTER BURNING.

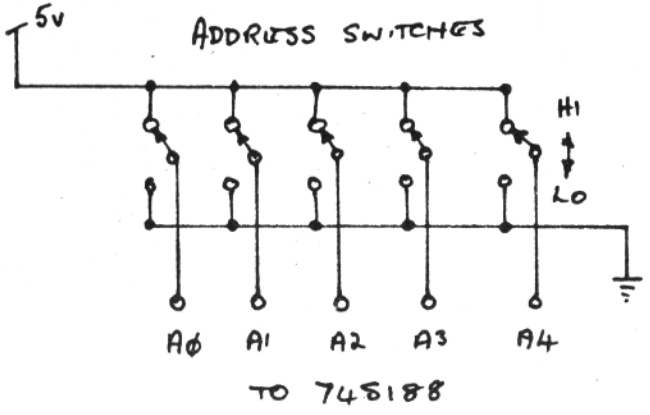
74S188 PROGRAMMER de VK5RY

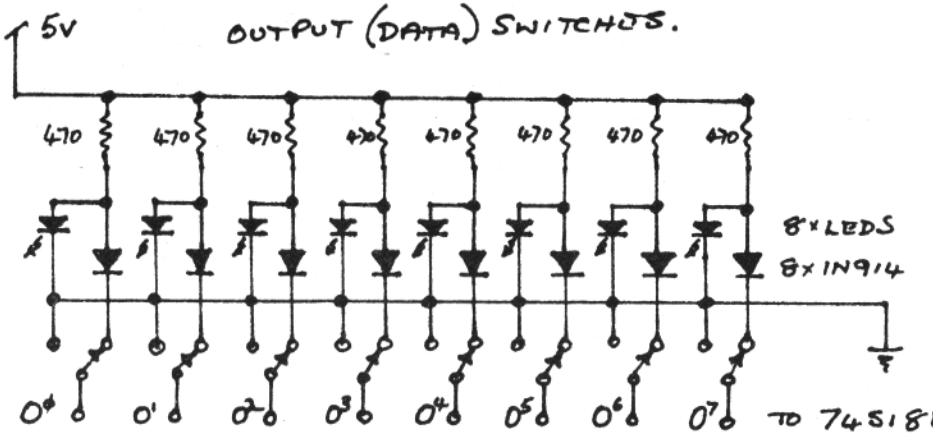
LM340T & 2N3055 BOTH FLAT PAKS GUARANTEED TO WORK WITH NO HASSLES.





IC1 = 7401
IC2 = 7400





DRAKE TR-7 CONTINUOUS SPECTRUM TRANSMIT MODIFICATION

B. Grokett,KR6E/WA0OEQ, 1127 Shirley Drive,Milpitas,CA 95035

The Drake TR-7/R-7 combination is a very high quality radio system that provides outstanding performance when used for Amateur RTTY operation. The TR-7 is normally capable of transmitting on all Amateur frequencies between 1.5 and 30 MHz. To enable the TR-7 to transmit on one of the new Amateur bands, however, it is necessary to program that spectrum segment into the AUX-7. There are a total of eight AUX-7 channels available for auxiliary programming. However, my TR-7 uses three AUX-7 positions for reception below 1.5 MHz and the other five AUX-7 positions are used for fixed frequency (autostart) monitoring on 80 and 20 meters. Therefore, if it is desireable to give the TR-7 transmit capabilities on any of the new Ham bands or non-amateur frequencies, such as MARS channels it requires eliminating some other function programmed into the AUX-7 such as reception below 1.5 MHz. A simple solution to this problem that also adds to the operating potential of the TR-7 is to allow continuous spectrum (1.5-30 MHz) transmit capability that is independent of any AUX-7 programming. This relieves the AUX-7 from providing transmit function on a non-amateur frequency and allows more options for fixed channel operation which is common with Amateurs using RTTY.

To begin the modification remove the outside cover of the TR-7. Then disconnect all plugs and the placement screw from the DR-7 and lift the DR-7 gently from its normal position. Now, the AUX-7 board and the digital control board are exposed. The AUX-7 is the first plug-in board directly behind the center front of the transceiver. The digital control board is a plug-in board that mounts immediately behind the AUX-7 board. Very gently pull the digital control board from its socket. Hold the digital control board component side up so that the 13 hole edge connector is in the upper right corner of view. Count down from the top of the connector to hole 11. This hole can be further identified because the collector of a transistor (Q201) mounted next to hole 11 is the only trace that pins out on 11. This trace is approximately 3/16 inch in length. With a sharp knife cut this trace so there is at least a 1/16 inch break in the conductor. This permanently leaves the transmit enable line high. At this point make any changes in the AUX-7 board as desired; then, reinstall all boards and the chassis cover of the TR-7.

This completes the modification and all functions of the TR-7 should be normal. One additional use of the TR-7 when this modification is installed is as a high performance signal generator and with the appropriate attenuation pads installed virtually any precise signal level can be achieved.

I would like to suggest that if your TR-7 with this modification ever be sold, the unit should be restored to its' original condition since such a versatile radio system should be used only by responsible operators.

Ben Grokett, KR6E

****
****

THE ST-6 FOR 110 BAUD.

FROM C.A.R.T.G. NEWS

BY:Eric, VE3GSI
216 Bridge St.W.
Napanee,Ont.Canada K7R 2E6

Before we modify the ST-6 we should mention some of the circuitry, in part. Originally, I chose the ST-6 demodulator because of its well designed circuitry and ease of servicing. Basically, during the reception of TTY signals, there are only 4 plug in boards used (not taking the power supply into account.)

1. 170 filter limiter board uses 3 toroids in a tuned bandpass configuration of 260 Hz by the book, but in actual measurement I found a bandwidth closer to 200-220 Hz on two different boards. This will be adequate enough to receive ASCII at 110 baud. The input to the board is 500 ohms and the output of most radios is 4-8 ohms, so a matching transformer should be used on the line.You WILL notice the difference by using one. They are easy to obtain for about $2.00 (8 ohm to 1000 ohm C.T.). The only adjustment on the board is control "R 160" which works like a voltage off-set adjustment. I found that the best way to adjust this control is to put an oscilloscope on pin 8 of the edge connector and with a weak input tone at 2210 Hz, adjust until the clipping is uniform, on both positive and negative peaks.

2. 170 discriminator, L.P. filter board, also uses toroids, one tuned for 'mark' (2125 Hz) and the other tuned for 'space' (2295 Hz). The output of both toroids are rectified and fed into an 'active' low-pass filter. Capacitor C 256 is in the feedback loop which controls the cut-off frequency. If you are using a .02 ufd capacitor, forget 110 baud, even the .012 ufd capacitor recommended for 75 baud is too severe. I found a .01 ufd capacitor adequate for 110 baud, with a cut-off somewhere between 55-65 Hz. It is NOT recommended to use a low value for 'C 256'. This eliminates erratic noise rejections from narrow pulse widths.

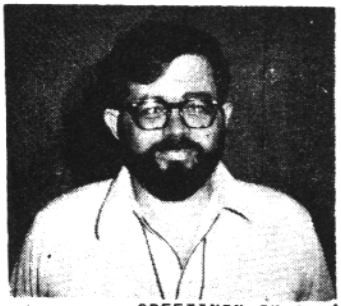
Circuit board 3, L.P. filter, slicer and keyer.

The input of this board uses a passive L.P. filter. Though not as critical as the active filter on the preceding board, you can benefit by changing the values of resistors 'R301' and 'R301' from 16 to a new value of 5.6 each.

Circuit board 4,anti-space,autostart.

In my estimation this board makes the ST-6 stand out from others on the market. No modifications need to be done to this board.

Have fun, will look for you on the bands.....Eric, VE3GSI



• RTTY-DX •

Skip Prinsen, WB6CYA-3611 Merrimac, San Diego, CA 92117.(714)276-3182

GREETINGS TO ALL!

I hope that everyone has recovered from the holidays with flying colors. The contests are all over for another year and it is time to look back on the year and see how we have faired in our quest for DXCC status. There were many new stations on this past year and with the birth of the solid equipment that is now readily available we are really seeing many new signals on the bands. I have not been on RTTY for all that long myself,nine years this year,and I have seen the popularity on a steady and rapid rise. I hope that it continues and also with it the calibre of the Ham that has been drawn to RTTY does not change. I listen up on the fone part of the bands from time to time to see where the band is open to and am very pleased that we do not have the garbage to put up with that goes on up there. I know that is why some are still on RTTY after they first got on just to see what it was like.

This month I got my computer station more in line with the state of the art by getting onto Micronet. Those of you that have the capibility type "R SIGS" after getting onto Micronet and then select the Heathkit Users Group bulletin board and leave me a message my ID number os 70340, 302. I am also on two local bulletin boards here in San Diego and check into these on a daily basis. Theie numbers are 714-449-5689 and 714-582-9557. I would be more than happy to hear from any of you that are into this mode of communications. I am using a Heathkit H-9 H-19 H17 with a cat modem and Softstuff's C.P.S. modem program.

Barry, W3FV is looking for QSL information on EA9EY, FY7BI and KV4AQ. The last two are no longer active and have left their QTH's. Does anyone know the whereabouts of any of these Amateurs? Please drop me or Barry a note so that he can get a much needed QSL card. Thank you.

Here is a listing of some of the stations that were active during the past few weeks:
VS5TX with JA1BK; DU1POL;TI2XG;A22PS/P/ZE; UAOCBO zone 19;VU2KU;GJ3FKW; EI3CN;4X6CV Jerusalem; VKOKH; 5NoDOG; FO3BL box 45 Papeete,Tahiti;CH8BI box 29 Frosinone,Italy 03100;TU2JJ;VP5AH via WA4DRU;3B8RS Amber,Klostermauer 3, 6471 Herzenheine,Fed.Rep of Ger; SV8CS;SVOAP via WB7NCF;UT5RP;Z53B; GD3YED;OD5MR'YBOACB;KHOAB on from Marianas (Siapan) 9M6MO,9M6MA,9M6BE all with the help of JA1BK;HH5MC will be on soon and also from Campbell Island will be a station with a ZL3--/A call.

My thanks to the many hams giving me their info to help make this column what it is. For this column the following hams gave inputs:KOPJ, W2PSU,K5WTA,W3FV,W4CQI,AND especially thanks to John,W3KV.

73's de "SKIP"

****

AWARDS SECTION

DXCC Award #51 dated December 15,1980 Johannes Chmielus,DL1IJ

****

DXCC HONOR ROLL FOR Jan.1980

1.	ON4BX	193/192
2.	W3KV	188/184
3.	ON4CK	186/181
4.	K7BV	187/177
5.	DK3CU	176/173
6.	W3DJZ	179/173
7.	I8AA	187/167
8.	I5WT	161/161
9.	W2LFL	165/160
10.	W4CQI	159/154
11.	W5EUN	156/151
12.	G6JF	140/140
13.	JA8ADQ	142/135
14.	W8JIN	136/133
15.	I5FLN	131/130
16.	F8XT	143/128
17.	K6WZ	136/126
18.	F5JA	132/123
19.	W3EKT	125/118
20.	W3FV	130/115
21.	W2PSU	117/109
22.	IOAOF	132/108
23.	DJ8BT	111/106
24.	W2IUC	117/105
25.	K3SWZ	110/105
26.	JA1DSI	117/104
27.	DJ3OE	103/103
28.	DJ1IJ	103/103
29.	VK2SG	119/101
30.	W6JOX	111/101
31.	W7MI	110/101
32.	KØBJ	113/100
33.	WB6CYA	101/91
34.	K4VM	93/88
35.	WA6WGL	102/85
36.	ON5WG	103/85
37.	SM6ASD	94/81
38.	WØHAH	88/81
39.	DK5WJ	101/76
40.	WA6CQW	85/76
41.	WØMT	79/76
42.	ABØY	85/75
43.	KØPJ/6	93/72
44.	W8CAT	66/59
45.	WB2VTD	67/57
46.	DF7FB	65/53
47.	K1LPS	65/51
48.	WA9AKT	63/48
49.	KØPJ/6	92/46
50.	WB5QBV	55/42
51.	OR4PL	64/22
52.	WA3ZKZ	36/12
53.	WA4JJY	38/11

****

HAM HELPS

WA4EBJ, C. Scott Johnson, 801 Nituna Avenue, Rossville,GA 30741.Scott writes that he has a CV-32 which uses 2 OB3 tubes and wants to know if any one can tell him about it? He is just getting started in RTTY and only has a printer.

Terry Ward, McCormick Str.Extension B-3, Dubuque,IA 52001.Terry writes that he is on SWL and was looking for a users report on either the Kantronics RTTY/CW reader or the Microcraft RTTY reader. Can anyone write one for us to print or write to Terry and tell him what you think of your unit. The RTTY JOURNAL is more than happy to do users reports on any item that is submitted to use concerning RTTY. Write to "DEE" or "SKIP" or any of the staff for that matter.

****

MURPHY-ISMS: If an experiment works, something has gone wrong.
: It works better if you plug it in!

5 CONTINENT WORLD RTTY 1981 CHAMPIONSHIP---I.A.T.G...

IATG has decided to sponsor a new series of contests for TTYers,all continents. Purpose is to stress inter-continental contacts rather than domestic contacts as in earlier contests.

The following contests have been organized: Australia-Oceania & Asia RTTY Flash 24-25 January 1981. North & South America Flash 28-29 March 1981,Europe & Africa Flash 23-24 May 1981. For each of the 3 contests there will be a general winner plus a winner from each of the two contests involved.Points will be awarded as follows:

A. for contest winners

first place	50 points
second place	46 points
third place	43 points
fourth place	41 points
fifth place	40 points

B. for continental winners

first place	25 points
second place	22 points
third place	20 points
fourth place	18 points
fifth place	17 points

Standings are independent, continental winners can also be general winners. At the end of the three contests-continental & general standing points will be totaled and a WORLD CHAMPION OF THE 5 CONTINENT will be declared according to the new final standings obtained.Prises will be awarded for the four first place winners.

****

AUSTRALIA-OCEANIA & ASIA RTTY FLASH CONTEST DATES:
05.00-1500 GMT 24 Jan.1981
05.00-15.00 GMT 25 Jan.1981
Bands: 3.5, 7, 14, 21, 28 MHz Amateur bands.

Country status: The DXCC list will be used except that the VE/VO,W/K,VK,PY, LU,JA,UAO/9 call areas will be considered as separate countries.

Classes: A. single/multi-operator with single transmitter. B. S.W.L.'s.

Messages: Messages will consist of: RST, Number of the QSO and one's continent (Example:VK4XX 599 72 Asia)

Exchange Points for QSO on:
3,5 & 7 MHz- 2 points
14 MHZ - 3 points
21 MHz -6 points
28 MHz - 8 points

No point or multipliers for contact with one's own country. Only 2XRTTY QSOs are valid.

Logs & score sheets: Use one log for each band. Logs must contain: date, time (GMT),call sign,RST-number of the QSO-continent sent and received,country and continent multiplier,points and final score. Each country may be contacted only once on any band,additional contact may be made with the same station if a different band is used.In order to qualify, all logs must be received not later than 28 February 1981.

Send them to: Prof. Franco Fanti, Via A. Dallolio n 19, 40139 Bologna, Italy.

Multipliers: multipliers are given for countries and continents. A multiplier is given for each country worked on bands 14-21-28MHz No multipliers for 3.5 and 7MHz or for one's own continent. A separate multiplier may be claimed for the same country if a different band is used.(max. 3 times). Only countries which appear in at least 3 other logs will be valid as multipliers,or the QSL of the contact.One's own country is invalid as a multiplier.The continents are valid as multipliers. For contacts with Europe or Africa, the sender and receiver will each be assigned 100 points as multiplier. 50 points will be assigned for each of the remaining continents contacted. After the above indicated calculation,world stations add 100 points for each station of Australia-Oceania & Asia worked on 21 & 28 MHz.

Scoring: Total points X Total number of countries X Total continents points + Total points Australia-Oceania & Asia station worked.Example:600 points for total x 10 countries worked x 100 continents points=6000,000 + 20 stations of Australia worked on 21-28 MHz giving a grand total of 602,000 points.

ATTENTION:OMs operating from North or South America Europe,and Africa contacting Australia-Oceania and/or Africa during promotional hours of 10-11 GMT on 24 Jan.1981 and 12-13 GMT on Jan. 25,1981 will Double their points for those periods.

Beginners: First time RTTY'ers in this contest will receive an additional 5% of their final score.

Handicap: 10% of the total final score of previous RTTY championship. And 8% of the total final score for winner of one or more previous RTTY contest.

SWL:Same rules as for above with the exception that: the same station is valid only one time on all bands.

****

NORTH & SOUTH AMERICA RTTY FLASH CONTEST-CONTEST DATES
18.00-02.00 GMT 28 Mar.1981
12.00-24.00 GMT 29 Mar.1981
Bands, Country Status, Classes, Messages, Exchange points, Logs and Score Sheets are the same as in the Australia-Oceania &Asia Contest above with the exception of date of reception which will be in this contest:30 April, 1981. Scoring will be the same as in above contest with the exception of the dates of the promotional periods:
19.00-20.00 GMT 28 Mar.1981
12.00-14.00 GMT 29 Mar.1981

Rules of Behaviour and Penalization: Logs must be compiled with the above mentioned rules. Contacts must be made by means of RTTY mode ONLY. That is other modes of transmission made use of ordinarily MAY NOT BE USED BEFORE, DURING OR AFTER the exchange of the message of Radioteletype. During the contest it is expected that Amateurs will observe fundamental rules of courtesy and good operating procedures. The contest disqualifications used by ARRL will be adhered to in this contest. Failure to comply with the rules will result in the exclusion of the entry and any such log will be considered as a check log.Logs with compiling errors of more than 10% of final score will also be excluded and used as check logs.Any log received will become the property of IATG and cannot be returned. The decision of the Committee will be final and any subsequent controversy may not be referred to any Civil Court.

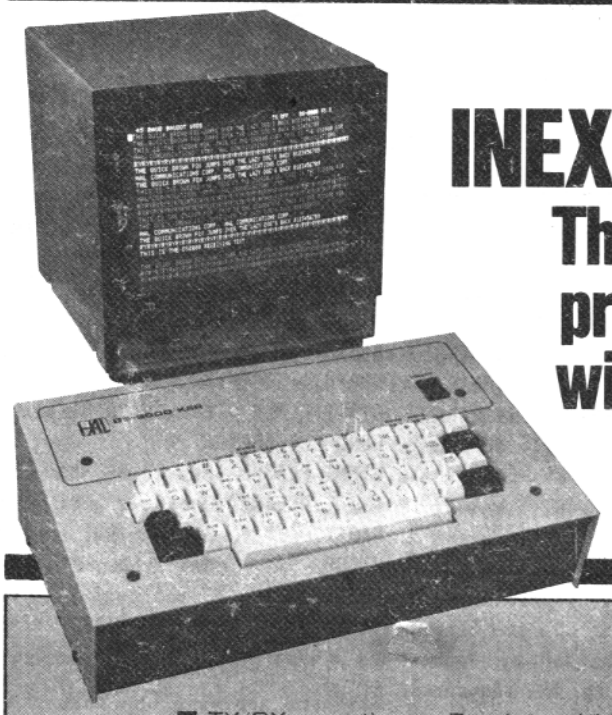
****

EUROPE & AFRICA GIANT RTTY FLASH CONTEST----DATES:
14.00-24.00 GMT 23 May 1981
08.00-18.00 GMT 24 May 1981
Bands, Country Status, Messages, Exchange Points,Logs and Score Sheets, Multipliers are the same as above for this contest. Scoring will differ in that Europe and Africa stations worked on 21 and 28 MHz will replace Australia-Oceania & Asia as was the case in the first contest and North and South America in the second contests above.

Promotional periods for this contest will be:
17.00-18.00 GMT 23 May 1981
10.00-11.00 GMT 24 May 1981

GOOD HUNTING TO ALL!!!!!!!!!

MORE DX ON PAGE 10



INEXPENSIVELY SUPERIOR

The DS2000 KSR is the lowest priced RTTY terminal available with these advanced features:

- TX/RX operation on Baudot and ASCII RTTY plus Morse Code (Morse RX optional)
- Integrated keyboard and video generator allows editing of transmit text
- Full 24 line by 72 characters per line display
- Bright/dim display of characters differentiates between TX and RX display
- Morse receive option may be added at any time
- Separate CW identification key for RTTY operation
- Status line on top of screen shows terminal operating conditions
- Pretype transmit message into 255 character buffer; edit before transmitting
- 2 programmable "Here Is" messages
- Word-wrap-around prevents word splitting at end of display line
- Word mode allows editing of text to be transmitted
- Quick Brown Fox and RYRY test message keys
- Small size metal cabinet gives effective RFI shielding from transmitters
- Loop compatible RTTY connections and plus or minus CW key connections
- 110 and 300 baud ASCII
- 45,50,57,74,100 baud Baudot
- 1-175 wpm Morse transmit
- 1-175 wpm optional Morse receive
- 120/240 v, 50/60 Hz power
- Internal CW side-tone
- UnShift On Space for Baudot
- Keyboard Operated Switch
- SYNC idle for RTTY
- One year warranty

Write or give us a call. We'll be glad to send you our new RTTY catalog.

HAL COMMUNICATIONS CORP.
Box 365
Urbana, Illinois 61801
217-367-7373

For our European customers, contact: Richter & Co. D3000 Hannover 1 • I.E.C. Interelco, 6816 Bissone/Lugano • Radio Shack Ltd., London NW6 3AY • Erik Torpdahl Telecom, DK 3660 Stenlose Denmark

DS2000 KSR	$499.00
ESM-914 Video Monitor	$169.00
MR2000 Morse receive option	$159.00

HITS & MISSES

George Hammon WA6CQW
14215 Pecan Park Lane SP 73
El Cajon, CA 92021

FROM
THE
MAILBAG

DX BULLETIN

I received a nice letter from Syd Molen,VK2SG.Syd explains the Australian,New Zealand Radio Teletype Society now has about 580 members. This fine gentleman has 123 countries worked on RTTY. ANARTS broadcasts every Sunday RTTY news at 0130 UTC at a frequency of 21095 KHz. Since the start of ANARTS broadcasts they have transmitted approximately 1,500,000 words,used 3,785 feet of paper and 17,140 feet of paper tape and about 40 ribbons. You might say a Guiness record, I would say a mighty fine job Syd. I would also like to share another part of Syd's letter with you. Syd wants to know why the ARRL does not broadcast RTTY DX news. Syd says, " we have asked ARRL to include RTTY DX information, but so far they do not seem to know that there is DX RTTY around." Well Syd I shall write to the ARRL and please write again,let's get this going. I think if we all write them again and again with DX information, they will start to do it. I think if we each write with RTTY DX information, they will start to do it. I think if we each write with RTTY DX information, as clubs and individuals we will see this accomplished.

I have copied RTTY DX info from time to time so it can be done but it will take input to the ARRL. I know if each Amateur and each club will send input we will see RTTY DX info on the ARRL DX Bulletin.

DECEMBER QST

The December QST has two fine RTTY articles. A state of the art terminal unit for RTTY by Michael Di Julio, WB2BWJ, and a crystal controlled AFSK generator by Greg McInre,AA5C. This was a nice Xmas present for the RTTY gang. This is a result of a lot of hard work by you the reader. Please, when you send in RTTY DX info, express your interest in RTTY and ask for more RTTY articles. Thanks to the ARRL for recognizing our interest. ANd when you think of RTTY don't forget that your JOURNAL also needs articles and input from RTTYers.

TRS 80 NET

The TRS 80 computer net is headed by WA6YKH. The net meets as follows:

Sunday	1900Z	14342KHz SSB	WA6YKH
Sunday	2200Z	14342KHz SSB	WD8JAJ
Daily	2300Z	14060KHz CW	VE6AMW
Daily	2300Z	14075KHz RTTY	WB6VOG
Weekends	0000Z	7145KHz CW	WD8AS
Weekends	1700Z	14085KHz RTTY	WA4AJY

CQ Magazine

In the December issue og CQ is a fine article on RTTY by Stephen Sweko AA4BG. The DX section of CQ, starting in January, will be headed by Hugh Cassidy,WA6AUD. Hugh is the former editor of the west coast DX bulletin. This should be a great column.

COMPUTERS

During 1980 I have tried to include as much information on computers and where they interface with RTTY. I believe that the 80's RTTYer will see an unparalleled growth. Several DX expeditions this last year took RTTY equipment along and put out new countries for all Amateurs, CW, SSB and RTTYers. The ease of computers make them a natural for DX expeditions.

YEARS END

I will close out my column for the last time this year. I hope each of you had the happiest of holidays. I look back over the year and wonder where the time escaped to. This was a good year for RTTY. The band conditions were never better. Each night I printed more and more newcomers to RTTY. I have received many letters requesting an article on the 28 ASR. The article is finished and will soon be submitted to our publisher.

SO LONG FOR NOW, GEORGE,WA6CQW

****

****

COMPU-WARD CONTINUED.....

Forward the verified list with $4.00 for each award.Send application to MICRO-80,2665 N.Busby Road,Oak Harbor Washington 98277. Foreign stations may substitute 10 IRCs for the award fees for each award.

****

CONTINUED FROM DX COLUMN
"KONTEST KORNER"

AUSTRALIA-OCEANIA & ASIA FLASH	-Jan 24-25,'81	DEC.80
BARTG	Mar 21-22,'81	DEC.80
NORTH & SOUTH AMERICA GIANT FLASH	Mar 28-29'81	DEC.80
EUROPE & AFRICA GIANT FLASH	May 23-24,'81	DEC 80
VK/ZL/OCEANIA	-Jun 6 -7 ,'81	coming
SARTG	August 1981	coming
WAEDC	Nov 7 -8 , '81	coming
CARTG	October 1981	coming

****

COMPU-WARD

Stations applying for this award may or may not have a computerized station,however ALL STATIONS CONTACTED MUST BE COMPUTERIZED,meaning the contacted stations' transmitter must be interfaced with a computer.All contacts must be made after January 1, 1980.There are two awards offered:
1 HF bands-29.7 MHz and below.
2.VHF.UHF-50.0 MHz and above.
All contacts must be made on one or any combination of the following:RTTY SSTV, CW and ASCII.No crossmode communications will be recognized.

Single band & mixed band exdorsement will be given with each band segment (HF,VHF,UHF etc.)Cross band operation will only be accepted for OSCAR contacts.All OSCAR contacts will be considered only for VHF/UHF accomplishments even though some of the OSCAR satellites have receive frequencies on 10 meters.Contacts via repeater are acceptable.

To qualify:Applicants WITH a computerized station must contact a minimum of 15 other computerized stations on the bands & modes authorized.

Applicants WITHOUT a computerized station must contact a minimum of 25 computerized stations on bands and modes authorized.

To apply,prepare a list,in prefix order, of calls worked,mode utilized, frequency or band,and date & time of each contact.DO NOT SEND QSL CARDS!!! Have your list verified by two fellow amateurs or have them notorized.

See column on left at bottom please.

MODIFICATIONS TO INFO-TECH 300-300C

VERNON SPELLMAN, K6CNJ

229 Doyle Park Drive, Santa Rosa, CA 95405

CW-ID on FSK from the keyboard of your Info-Tech 300 or 300C? Sure you can. Here are two simple modifications you can make to these popular keyboards to simplify IDing on FSK. Also, for you 'slow typers', a modification to give you a variable character-rate output on these keyboards.

Probably the easiest modification to give CW-ID on FSK is on the earlier model 300 Keyboard. Simply connect the output of the Morse monitor (through a switch if desired), to the base of the MPS-5172 transistor which drives the FSK loop keying transistor. In case the Morse monitor output is used for another purpose, just duplicate the Morse monitor output circuit (the 12K resistor and the transistor). Connect the duplicate circuit in parallel with the exixting circuit except for the collector (which goes to the loop-keyer driver transistor base as above). In case the keyboard is sometimes used in the Morse mode the optional switch will prevent keying the FSK loop while in the Morse mode.

While still quite simple, modification of the 300C keyboard needs a different approach. Of a number of ways possible to do it, the system described proved to be the easiest to do.

1. Remove the trace between pins 5 and 6 of IC-15.
2. Connect two 10K $\frac{1}{4}$ watt resistors in series between pin 5 of IC-15 and pin 7 of IC-16.
3. At the center of these two resistors, connect a lead and run (through a switch if desired) to pin 9, IC-16
4. Remove IC-15 (4011) from its socket and replace with a 4001.

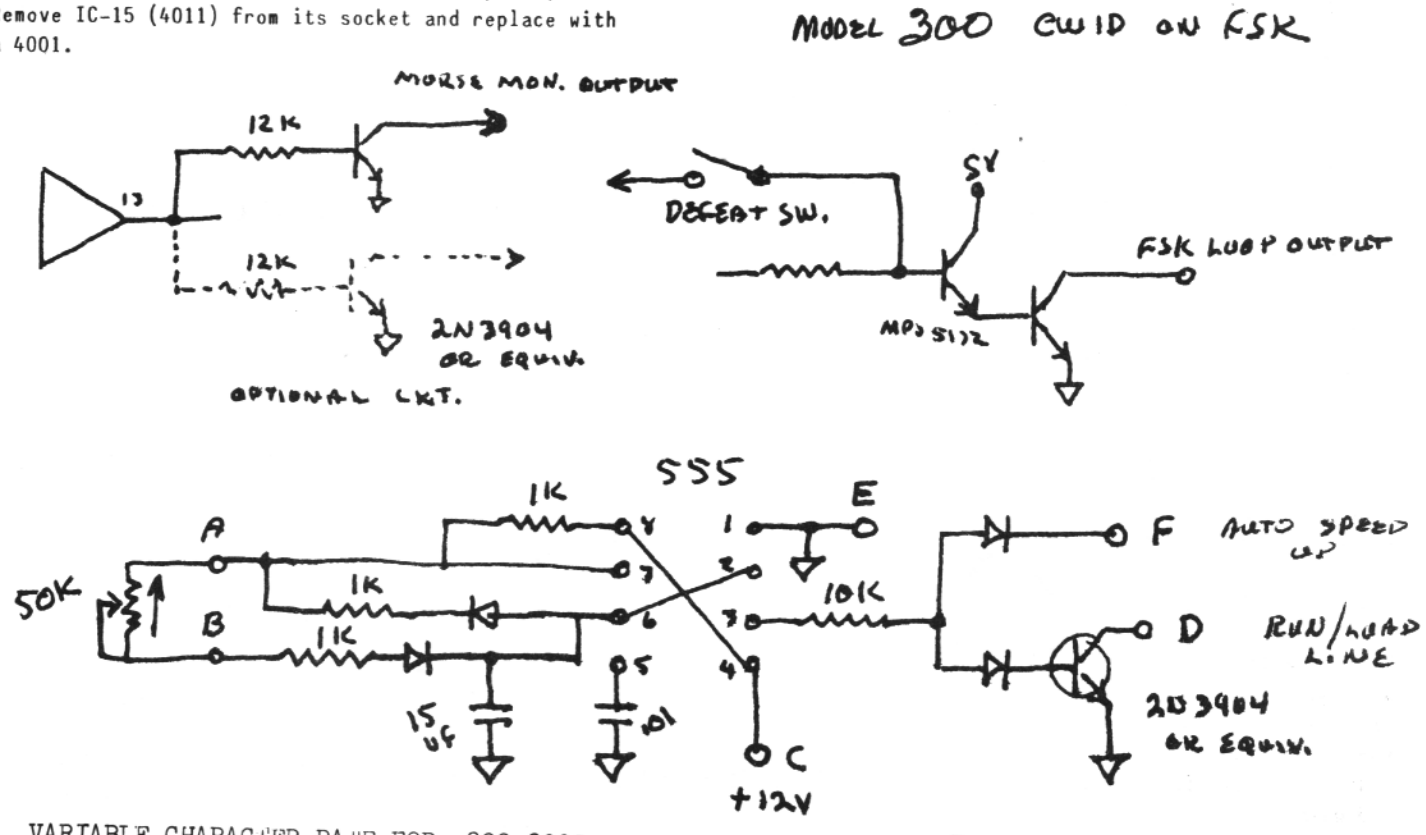
The variable character-rate circuit is based on the popular 555 IC clock. It simply gates the buffer run/load line between run and load at a rate selected by the operator with the rate control pot. An additional feature of the circuit automatically speeds up the output if one over-fills the buffer while in a slow character-rate output. Connections to the keyboard are simple and require no alterations to the keyboard circuit board. A switch may be placed in the lead going to the run/load line so the variable rate may be switched in or out. Connections to the two keyboards are as follows:

A & B- to 50K rate control pot.
C- to 12 volt line (pos.)
D- to buffer run/load line. (the line going to either the toggle switch on the 300 or to the key switch on the 300C.
E- Ground.
G- to the collector of the buffer full light transistor on the 300 or to pin 6 of IC-16 on the 300C.

Kayboards should be operated in the KOS (ie.CTRL/'X') mode and the diddle feature should be turned off when using the variable character-rate.

If desired the variable-rate circuit board with the components installed may be obtained from the author for $17.50. See beginning of article for address.

See Page 12 for another schematic



VARIABLE CHARACTER RATE FOR 300-300C

A-650 MACROTRONICS RTTY INTERFACE APPLE II MICRO-COMPUTER

CHUCK EDWARDS,W6MNO
4726 Barbarossa Drive
San Diego, CA 92115

Macrotronics interfaces for Amateur Radio Teletypeing are really nothing new! This company has been marketing interface devices for some time enable RTTYers to interface their equipment with their microprocessors.

Now, they have designed and are in production with an interface for the very well known Apple II computer.The Apple II, as everyone knows, is one of the more popular computers using the 6502 MPC. One excellent feature of this particular interface is that it contains its' own complete TU, In addition, Macrotronics provides a more versatile TU that is designed for heavy QRM on the HF bands, at a small extra charge. However, the TU furnished with the unit performs very well indeed on the VHF bands and will also perform well on low bands, especially if an input filter is used. Actually, I added the double filter featured in an issue of 73 Magazine.

The interface is easy to interconnect with your Apple II or Apple II plus. There is a single 16 wire ribbon cable furnished by the factory, that connects into the "game port". There are 2 Molex connectors on the rear of the interface cabinet that interconnect to your transciever or external TU. For audio, AFSK and PTT connections. Extra mating Molex connectors are furnished,however the 4 or 5 shielded wires necessary are not furnished.

Instructions furnished are very descriptive and loading of the program from the furnished cassette is simple. Eventually I transferred the program to a floppy disk in the interest of time.

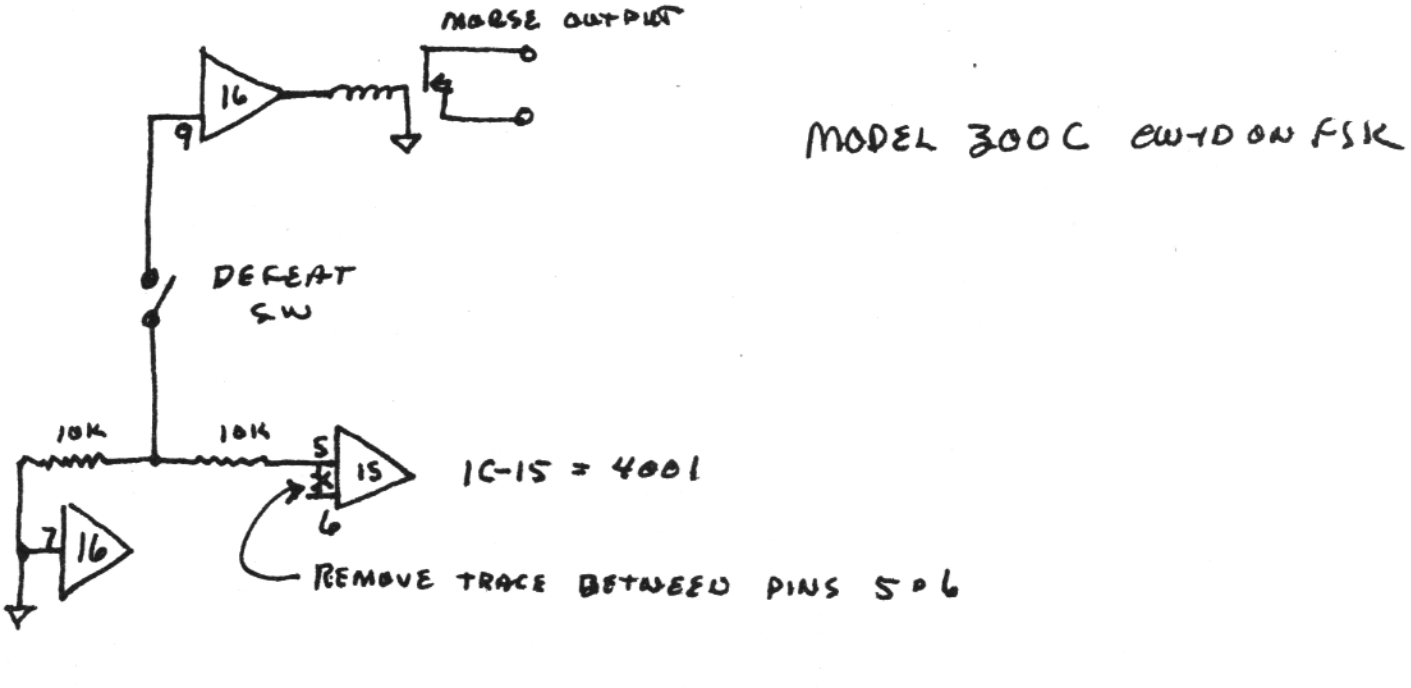
The CW ID'er,which is easy to program, can be printed by hitting the control key and "A". This will insert your CW ID anywhere desired and the printing will continue with no waiting. If the control key and "I" are hit, will insert your ID at the termination of your print and automatically return to receive mode.You can also use it as terminator for your Sel-cal and WRU, even if your "NNNN" function fails. When using the ASR function,and you have your buffer full of type you can interupt,hold the buffer and answer another station asking for a "BK" to find out how he was printing.

I found interference leaking into my TS-820S and into the Apple while running "transmit" over about 20 wats so added .001 bypass disk caps on every i/oput wire at each end from the 820S to the interface and grounded the interface to the computer power supply and to the 820,it worked..no more interference. I also installed a toroid sintered iron ring around the 16 wire ribbon going between the Apple game port and interface.

I preferred using my Dovetron TU. This allowed me to plug the Apple into my loop circuit much the same as a printer or TD,also allowing 'hard copy'. Either baud or ASCII machines may be used.

If you have an Apple and are interested in interfacing to RTTY try it you will like this combination.W6MNO

SCHEMATIC FOR MODIFICATION TO INFO-TECH 300-300C



CLASSIFIED ADS

30 WORDS $3.00, ADDITIONAL WORDS 5¢ EACH_CASH WITH COPY--DEADLINE 1st of month for following month.

RTYM80 is an adaption of the Bit-Byter RTY-80 (C) software for use on the M80 board.Split screen & type ahead of buffer.(See Bit-Byter ad.this issue).Price $30.00PPD. Vic Frump, K8EXJ.Phone 340-372-2047,UHF Sales & Service Co,Rt.1,Box 52A, Evans, WV 25241. Specify:Name,address, call & level 1 or 2.

TELETYPE MACHINES, All makes & models and allied items. 25% off on everything.SASE for list.Goodman 5454 S. Shore,Chicago,IL 60615,312-753-8342.

UPGRADE SUCCESSFULLY!!Make the next trip to the FCC count!New 1981 License Exam Review now available for TRS-80 16K cassette based computers. 12 programs totaling 98K for each license class.Specify General, Advanced or Extra.Only $19.95 each.All three $39.95 PREPAID."SUPER-LOG",the popular logkeeping system,the ultimate, only $12.95."MICRO-CLOCK" 19-function timepiece,zones of the world,automatic ID and timer $5.95.MICRO-80 INCORPORATED,W-2665 Busby Road,Oak Harbor,WA 98277.

WHOLESALE DIGITAL CASSETTES ONLY 79¢ for C-20's in lots of 24 each.Fully Guaranteed!Computer Grade.Used by serious Programmers and Software Firms Nationwide!Wholesale Listing on request!MICRO-80 INC.W-2665 Busby Rd, Oak Harbor,WA 98277.

NEWS-NEWS-NEWS-Amateur Radio's Newspaper "WORLDRADIO".Trial Subscription Two issues for one dollar.WORLDRADIO, 2509-F Donner Way,Sacramento,CA 95818

FOR SALE: Model 35KSR Teletype machine,excellent condition.$400.Skip Prinsen,WB6CYA,3611 Merrimac Ave,San Diego,CA 92117.714-276-3182

WE "SPECIALIZE" IN RTTY Equipment and supplies.Authorized Dealer for the fabulous "INFO-TECH"RTTY/CW/ASCII equipment,including models;M-100E,Video Converter:M-300C Super Tri-mode Keyboard;M-200F Tri-Mode Video Converter:M-70 Code & Speed Converter: Magnetic Tape Interface.Also HF Transcievers,amplifiers,antennas and other general Ham Radio equipment. Call or write DICK,KOVKH,Dialta Amateur Radio Supply,212-48th St.Rapid City,SD 57701,605-343-6127.Special quotes for special people!

KITS & PARTS FOR THE RTTY AMATEUR, featuring the famous MEG-1 Demodulator,ID-1 CW ID'er,and IPT-1 Interface,Power Supply,& Timer.These units available as kits,or fully assembled, plus a wide selection of quality new components,make the Midnight Engineering Group well worth checking out.And don't forget our carbide drill bits,now more sizes available. Send 15¢ stamp for catalog.Midnight Engineering Group.POB 349,Galesburg, IL 61401.

SALE*SALE*SALE*SALE*SALE;heavily inked UPI ribbons,fits all Teletype machines $6.50 dozen;Dual spool red & black ribbons $14.50 dozen;Perforator tape 11/16" x 8" case of 40 rolls $19.50;1" x8" case of 28 rolls $19.25 Black 1"x8" box of 7 rolls $7.50; strip printer tape 3/8" wide,ungummed box of 25 rolls $14.00;Model 28 self-contained;stand-alone typing reperf with 3 speed gear shift $120;Single speed $95;Model 28 TD $99;Roll paper, Canary or white,5" diameter,case of 12 rolls $25.00;Model 28 ASR complete but not rewired nor checked $255;Model 28 ASR complete & checked,rewired for local loop $300;Model 28 typing units,sprocket feed,less type box $99 Model 28 typing units,friction feed, less type box $149;Model 28 ASR auxillary reperf type LARP complete with motor,base & mounting studs to fit inside model 28 ASR cabinet behind TD $99.All prices are FOB Brooklyn,NY ATLANTIC SURPLUS SALES,3730 Nautilus Ave,Brooklyn,NY 11224,Tel;212-372-0349.

FOR SALE:5th edition of the "LIST OF RTTY STATIONS IN FREQUENCY ORDER",now contains more than 1200 frequencies monitored in 1979-80 of commercial stations like press,aeronautical, weather,telex,military,diplo,maritime etc, on shortwave.Schedules of around 70 news agency stations,and more than 180 special abbreviations are also included.This offset printed list is airmailed to you for $16 or 39 IRC from Joerg Klingenfuss,Panoramstrasse 81,D-7400 Tuebingen 7, West Germany.

SATELLITE TV RIPOFF?Building a Satellite TV terminal? Tired of "Information Package" ripoffs? Let's band together and exchange information on the best LNA's,mixers,kits,P/C boards antennas and on the ripoffs! Send a SASE (1-15¢ stamp) and your comments, compliments,complaints,RIPOFFS,etc, and I will duplicate information received and return in your SASE.Mitch, WA4QSR.Box 973,Mobile,AL 36601.

THOUSANDS OF COMMERCIAL RTTY STATIONS are active between the amateur shortwave bands.Many of them can be easily printed with your existing equipment. (Take care of legislative restriction if applicable!)If interested,you need "software",compiled from nonstop monitoring the complete shortwave spectrum.I have up-to-date frequency, callsign,schedule,code lists on press military,diplo,telex,aeronautical, weather etc,stations.Write for details.Joerg Klingenfuss,Panoramastrasse 81,D-7400 Tuebingen 7,Germany

MODEL28 ASR's with typing perf $300. Pick-up only.John Gilmore,W8ZZD, 3220 Lynwood,NW, Warren OH.216-898-2100.

TELETYPE ASR33 COMPLETE w/stand,paper tape and manuals.Just refurbished by Teletype.Works perfectly.$400 or best offer by March 1st.Steve Larson,N3SL, 1525 S. Lansing St.Aurora,CO 80012. 303-752-3768.

FORSALE:2nd edition of the "LIST OF ABBREVIATIONS,CODES AND TABLES USED IN RADIOCOMMUNICATIONS",now contains: 170 general abbreviations;260 Q-code groups from QAA to QUZ;300 military and civil Z-code groups from ZAA to ZZZ;phonetic alphabet;signal reporting codes;symbols for designation of emissions from A0 to P9 and for classes of stations;table of frequency allocations from 10kHz to 150 MHz,and common use of frequencies.This offset printed list is airmailed to you to $9 or 20 IRC from Joerg Klingenfuss; Panoramstrasse 81;D-7400 Tuebingen 7, West Germany.

DIGITAL ELECTRONIC SYSTEMS, INC.

1633 WISTERIA CT. ENGLEWOOD, FLA. 33533 813-474-9518

The INFO-TECH M-77 COM-CLOCK

A microprocessor based station accessory that will, on command:

1. Send your call in Morse, Baudot, or ASCII.
2. Send date and time in Morse, Baudot, or ASCII.
3. Respond to sel-calls with pre-programmed message.
4. Give continuous readout of date and time on built-in L.E.D. display.
5. Act as a beacon controller sending call, date, time, and pre-programmed message.
6. Act as a programmable clock with several function outputs.
7. Perform a host of other functions using the built-in 16 button keyboard.

Inputs: MIL 188, TTL, EIA, isolated loop, PTT, remote operate

Outputs: MIL 188, EIA, TTL, isolated loop FSK $\overline{\text{FSK}}$ AFSK (2 shifts) grid and cathode keying, + 6 open collector programmable outputs.

Available about February 1, 1981

For more information write:

Digital Electronic Systems
1633 Wisteria Court
Englewood, Fl. 33533

INDEX TO RTTY ARTICLES $1.00 PLUS SASE/41¢ STAMP.

RTTY BEGINNERS HANDBOOK STILL $4.50.

GET EITHER OR BOTH FROM: RTTY JOURNAL, P.O. BOX RY, CARDIFF-BY-THE-SEA, CA 92007 U.S.A..

WANT ADS CONTINUED

TELETYPE MODEL 28.Printer,tape punch and reader all in one nice looking floor unit.Clean-like new with loop power supply $150,pickup only or meet you ½ way up to 100 miles.J.R.Doak, 45 Allen Dr.,Woodstock,NY 12498.

PUT RTTY INTO YOUR S-100 Bus computer AR-1 card contains ST-5,AK-2 and baud rate generator (45.5,50,75 & 110). Software programmable baud rates and ASCII/BAUDOT.Bare board $45,Kit $245, Assembled & tested $349.Xtal and toroids $15.Add 10% for shipping,excess refunded.Write for flyer describing other S-100 hardware & Northstar software for Amateur Radio.Snow Microsystems Inc.Box 1704,Silver Springs, MD 20902.

TELETYPE PARTS WANTED:Highest prices paid,old or new models,especially model 15,any quantity.Send list/call Van,W2DLT,Teleprinter Corp., Box 15, Berkeley Heights,NJ 07922.(201)464-5310 days.

TELETYPE SYSTEM FOR SALE.Model LO 15 complete with built-in tape gear,auto ID on both RTTY & CW,power unit, transmit/receive switching unit,provision for AFSK unit.All working, taken off the air in Dec.'80.Complete system excellent condition.Will deliver within 100 miles/you pick up. WA3ZKZ,115 S.Spring Valley Rd.,Wilmington,DE 19807. 302-994-9588.

WANTED: 3" SCOPE FOR RTTY.WANTED:ST-5 or ST-6 TU,factory wiredm no mods please! Contact Brian,VE7EJ, 5888 124th St.,Surrey,BC,Y3W3W5 PH 604-596 9889.

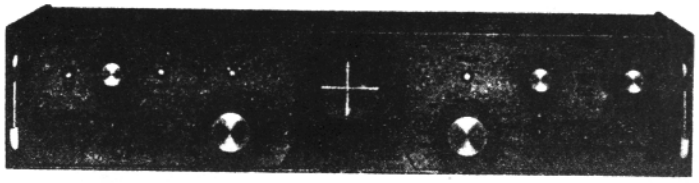
HAM RADIO MAGAZINE-The no-nonsense state-of-the-art technical magazine. Dozens of exciting projects and an emphasis on quality un-matched by any other magazine.Subscribe and see for yourself.1 year $12,2 years $22 & 3 years $30.Ham Radio Magazine, Greenville, NH 03048.

MODEL 33 ASR.LIKE NEW Condition with pedestal and copy holder and all manuals.20 ma interface.Sacrifice $275 plus $15 shipping.F.Stover,8837 Outlook, Overland Park,KS 66207.Phone; 913-648-5539.

WANTED:60 WPM LITTLE MITE Teletype, with keyboard up and running.Write, WB7EVC, POB 17016,Irvine,CA 92713.

FOR SALE: ONE HAL ST-5000 TU 2 months old-HAL-DS 2000 electronic keyboard with CW board installed.Both $615-as new,cost $900.Phone 213-997-0167.5727 Sunnyslope,Van Nuys,CA 91401----N6CPP

DOVETRON

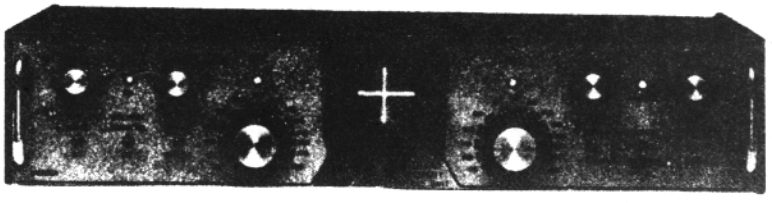


MPC-1000C

Multipath Correction
In-Band Diversity &
AFSK Tone Keyer

Amateur Net: $545.00

Standard features include CONTINUOUSLY tuneable Mark and Space channels (1000 Hz to 3200 Hz), Dual Mode (MARK or FSK) Autostart and internal high level neutral loop keyer (20 to 60 ml). Both EIA and MIL FSK outputs are provided for direct interface to microprocessor and video terminal peripherals.

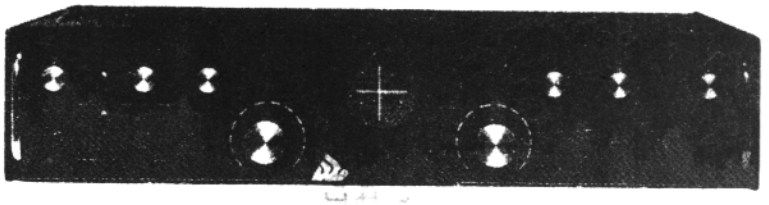


MPC-1000CR

Signal Regeneration &
Speed Conversion

Amateur Net: $645.00

A front panel switch permits internal TSR-200 Signal Regenerator-Speed converter assembly to electronically "gear-shift" between 60, 67, 75 and 100 WPM. All incoming and outgoing signals are regenerated to less than 0.5% bias distortion. Also available with DIGITAL Autostart (TSR-200D): Amateur Net: $695.00



MPC-1000R/-TSR-500

Dual UART Regeneration,
Speed Conversion, 200
Char. Memory, Word Correction & DIGITAL
Autostart

Amateur Net: $895.00*

The MPC-1000R/TSR-500 provides Preloading and Recirculation of the 200 character FIFO Memory, a keyboard-controlled Word Correction circuit, Variable Character Rate, Tee Dee Inhibit, Blank/LTRS Diddle, a Triple Tone-Pair AFSK Tone Keyer and a Character Recognition/Speed Determination DIGITAL (DAS-100) Autostart mode.

***The MPC-1000R is also available without a TSR assembly and functions as a MPC-1000C with a Triple Tone-Pair AFSK Tone Keyer. This "Basic-R" permits future expansion with a TSR-100, TSR-200, TSR-200D or TSR-500 by simply lifting the lid and plugging in the appropriate TSR assembly: Amateur Net (Basic-R): $595.00**

Your QSL will bring complete specifications, or call: 213-682-3705.

DOVETRON

627 FREMONT AVENUE
(P. O. BOX 267)
SOUTH PASADENA, CA. 91030

RTTY Journal

PO BOX RY

Cardiff by the Sea, CA. 92007

SECOND CLASS PERMIT PAID
AT ENCINITAS, CA 92024